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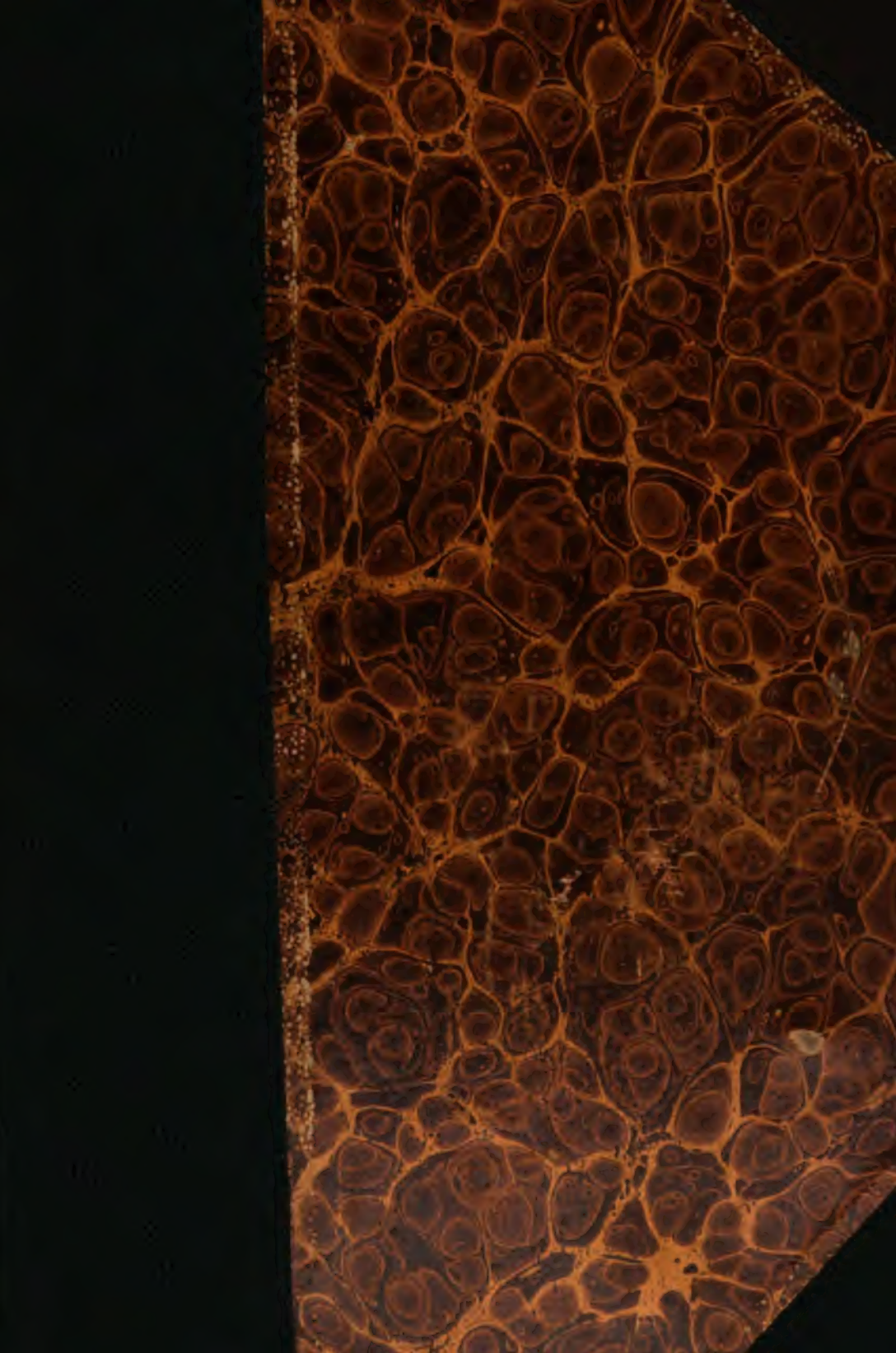
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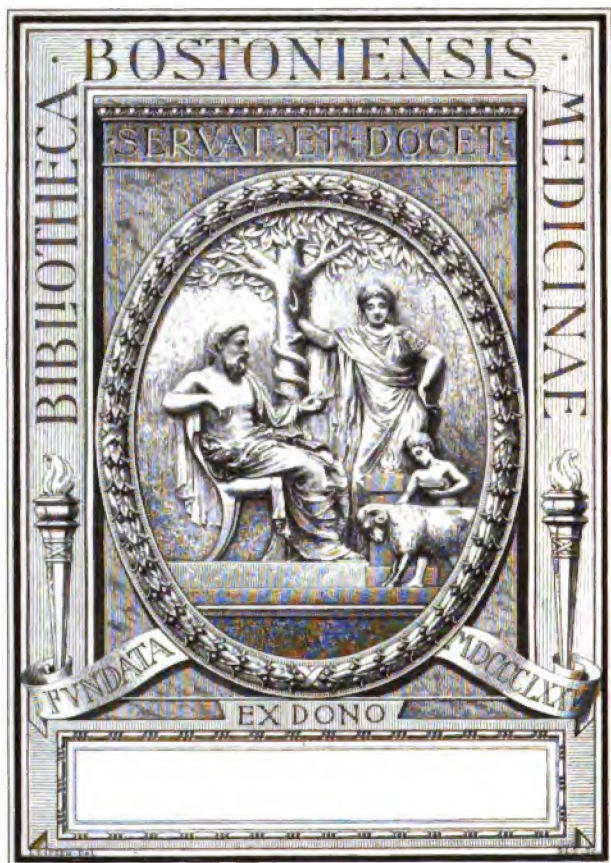
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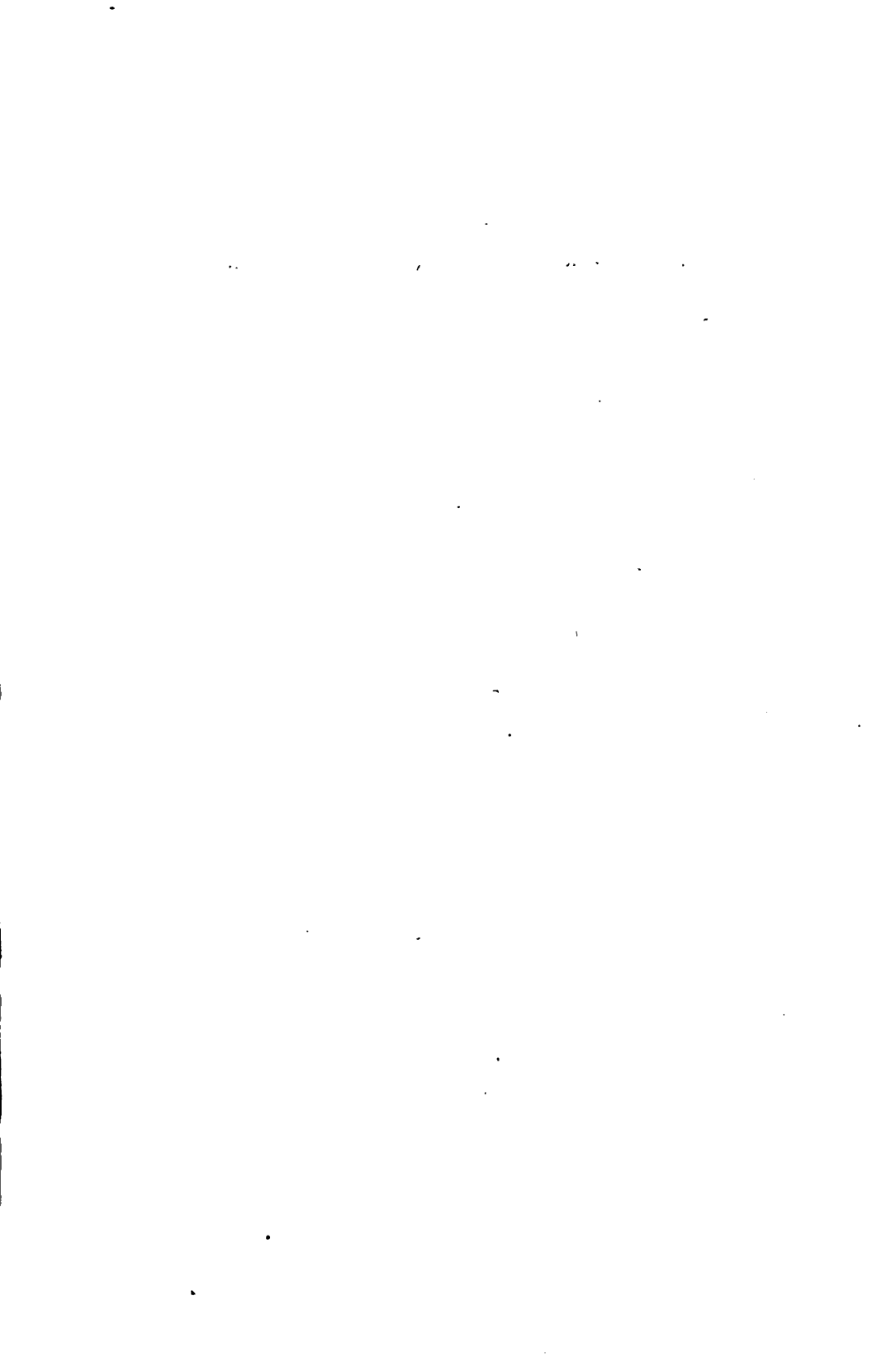
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ANNALS OF OPHTHALMOLOGY

A QUARTERLY JOURNAL AND REVIEW OF
OPHTHALMIC SCIENCE.

FOUNDED BY JAMES PLEASANT PARKER.

JAMES MOORES BALL, M. D., MANAGING EDITOR,
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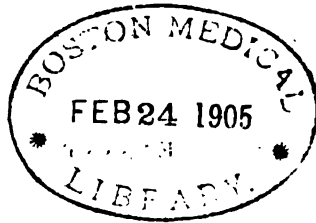
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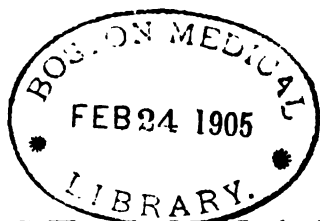
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SYMPATHETIC OPTHALMIA.*

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The true nature of sympathetic ophthalmia, the most dangerous disease to which the eye is exposed, is still somewhat obscure but recent investigations have proved that it is due to micro-organisms, traveling from the injured eye. It is usual to speak of the injured eye as the "exciter" while the one secondarily affected is called the "sympathiser." The morbid changes in the former which are likely to give rise to sympathetic inflammation may be classified as follows:

1. Penetrating wounds of the ciliary region accompanied by prolapse of the iris and ciliary body are, above all others, the most likely to cause sympathetic disturbance, and all the more readily, should the wound be lacerated, and should the instrument with which it was inflicted have been unclean.

2. Foreign bodies lodged within the eyeball, more partic-

*A Post-Graduate Lecture delivered at the Glasgow Ophthalmic Institution, December 16th, 1902.

ularly if they lie near the ciliary processes, are a constant source of danger, since they keep up inflammatory reaction in the whole uveal tract.

3. Degenerative changes in an eye previously injured are always accompanied by a certain amount of irido-cyclitis, and consequently an atrophied globe, tender and irritable through calcification of the lens and ossification of the chorioid, is invariably a menace to the sound eye.

4. Corneal ulcers which have perforated may form the starting point for a sympathetic ophthalmitis, but it is interesting to remember that an eye which has burst from within is not nearly so dangerous as one in which perforation has occurred from without. Moreover, all clinical experience goes to prove that after panophthalmitis the danger of a transference of infection from one side to the other is very slight.

5. Sarcoma of the chorioid, or dislocation of the lens, accompanied by plastic irido-cyclitis may also induce sympathetic inflammation, but these are probably the only instances in which the disease arises apart from the existence of a perforating lesion of the "exciter."

The kind of eye which most frequently endangers the safety of the other is one which, in consequence of perforation by injury or ulceration, has been attacked by plastic irido-cyclitis, and has become soft and tender to touch. The length of time that may intervene between the injury and the onset of sympathetic inflammation is very variable. It probably never occurs earlier than three weeks, but there is after that, practically no limit to the interval which may elapse before it declares itself. On an average it develops most frequently five or six weeks after the accident, and if the second eye escape until the one injured has healed, it will probably not occur at all unless fresh inflammation or degenerative changes occur in the exciting eye. In the latter case the attack may not take place for many years.

The insidious nature of the onset of sympathetic ophthalmia is one of its most outstanding characteristics, for, although it is occasionally ushered in by severe pain and other symptoms of acute inflammation, it usually develops in a manner so treacherous, that serious results are not anticipated until the disease is thoroughly established. It may make its appearance at any age, but is more frequent in the

young than in the old, and particularly so in children who are naturally delicate and of a highly neurotic temperament. When once it has started it is extremely difficult to arrest. Even under the most favorable conditions it runs a protracted course, and though recovery occasionally takes place, the result is very often total blindness. The destruction of the sympathizing eye is, indeed, often more complete than that of the one which received the injury and the knowledge of this fact adds greatly to the responsibilities of the surgeon, when he is called upon to treat a case in which sympathetic inflammation has fully developed, and where the exciting eye still retains a fair amount of sight.

The principal points relating to the origin, progress and termination of sympathetic ophthalmia were shown in the following case:

M. K. was a pale, delicate looking child of ten years of age. Her sight had always been defective, but as she was able to run about with other children, the full extent of her visual difficulties was not appreciated until she was seven years of age and was sent to school. It was then discovered that she was suffering from cataract in both eyes. An operation performed on the right eye in 1892 was followed by inflammation, and though she was detained in the hospital for many weeks, the right eye was still red and tender looking when she returned to her home. Shortly afterward the left eye also became inflamed, and its sight began to fail. From that time both eyes were tender, intolerant of bright light, and subject to recurrent attacks of inflammation. There had not, at any time, been much pain, and the redness of the eyeballs had never been great, but vision had steadily grown worse until she became blind in both eyes.

When I first saw her on the 2nd of December, 1895, she presented a typical example of chronic inflammation, involving the whole uveal tract. Both eyeballs were soft, and the right globe was shrunk and misshapen from the pressure of the ocular muscles. There was no pain, but there was slight tenderness on palpation over the right ciliary region. For a short time after each examination of the eye, a faint pink blush surrounded the cornea, but at no other time was there any injection of the conjunctiva. The right cornea was clear, but the left presented a few dirty, greasy looking spots on its posterior surface. Both irides were discolored, and there

was a coloboma upward—the result of an iridectomy—in the right. They had a dull greyish-green appearance, and scattered over their surface were several brownish-black spots due to exposure of the uveal pigment through stretching and wasting of the overlying iris stroma. This peculiar coloration and these atrophic changes caused the irides to look rotten. The pupils were fixed owing to complete posterior synechiae, and there was slight bulging of the iris into the anterior chamber. The right pupil was occupied by inflammatory exudation, which was white and clear in its central portion, and bound to the iris by means of fibrin. The left pupil was occluded by a membranous opacity, to which the iris was firmly attached. It was impossible to illuminate either eye by means of the ophthalmoscope.

For more than a year there was little change in the appearance just described, but after that time the "sympathiser" began to shrink rapidly. There was no pain, but the sclerotic was covered by a pink injection, blood appeared in the anterior chamber, and the iris became green in color from staining by the blood. In the right eye there was still a perception of light, but the left was totally blind, probably owing to detachment of the retina,

It is always necessary to draw a distinction between sympathetic irritation and sympathetic inflammation; for the former is simply a neurosis and passes off without leaving any organic changes, but the latter is plastic, and in the long run involves the whole of the internal structures of the ball.

1. *Sympathetic Irritation* is usually an early symptom, but is often met with in cases where the injured eye has been blind for a long time and is undergoing degenerative changes. Its characteristics are: The patient feels that his eye soon gets tired; has difficulty in reading small print; and after prolonged work suffers from transitory attacks of dimness of vision when he looks at distant objects, or it may be from momentary total blindness. He feels uncomfortable in a bright light, which may cause neuralgic pains to dart through his head, and induce injection of the conjunctiva, accompanied by copious lacrimation.

2. *Sympathetic Inflammation*. This may or may not be preceded by the symptoms just described, and usually failing sight is the first warning that the patient receives of the de-

velopment of the disease. When the eye is examined a zone of pink hair-like vessels is seen surrounding the cornea; the iris is dull and the pupil is small and sluggish, and dilates irregularly after the instillation of atropine. Even at this early stage there may be neuro-retinitis and floating bodies in the vitreous, but more frequently there is difficulty in seeing the details of the fundus, owing to haziness of the media incidental to inflammation of the uveal tract. The cornea also becomes inflamed, spots form in its posterior surface—keratitis punctata—the aqueous is turbid, and the anterior chamber deep. The corneal signs are all the more marked when the inflammation assumes the serous type—serous irido-cyclitis—but the plastic form is by far the most frequent. Bloodvessels now develop upon the surface of the iris, whose substance thickens and bulges into the anterior chamber, the exudation filling up the pupil, and later on gluing the whole posterior surface of the iris to the capsule of the lens—complete posterior synechiae—matting the ciliary processes together, and implicating the chorioid so extensively that the nutrition of the eye is seriously affected. As a result the iris is retracted at its ciliary attachment, the tension which up to this stage has been increased now diminishes, the lens becomes cataractous, and the shrinking vitreous causes detachment of the retina and of the anterior portion of the chorioid. Up to this time there has been perception of light, but now blindness becomes total. The eye is liable to recurrent attacks of irido-cyclitis; its bloodvessels degenerate, and, rupturing, give rise to intra-ocular hemorrhage; it steadily shrivels, and the final result is phthisis bulbi.

Mackenzie was the first to demonstrate that traumatic irido-cyclitis of one eye is capable of inducing destructive inflammation of its fellow, and he considered that the noxious influence was transmitted from the one to the other by the bloodvessels, by the ciliary nerves, or by the union of the optic nerves. The last hypothesis was the one which claimed his special favor, and he believed it "extremely probable that the retina of the injured eye is in a state of inflammation which is propagated along the corresponding optic nerve to the chiasma, and that thence the irritation which gives rise to inflammation is reflected to the retina of the opposite eye, along its optic nerve." Since Mackenzie's day many speculations have been advanced, and numerous experiments un-

dertaken, to explain the pathogenesis of sympathetic ophthalmia. The most outstanding of these is the work of Leber and of his pupil Deutschmann. The former advanced the theory that sympathetic inflammation was the result of a septic, infectious process in the injured eye, and that the micro-organisms traveled along the optic nerves to the sound eye; the latter set himself to prove these theories by experiments conducted on rabbits. He injected fluid containing staphylococci into the sheath of an optic nerve, and traced the micro-organisms across the chiasma in their course along the optic nerve of the one eye to reach the optic nerve of the other. He asserted further that when the staphylococci reached the sound eye they set up in it a typical sympathetic inflammation. For a time the difficulties of explaining the origin of ophthalmia migratoria, as the disease was now called, seemed to be ended, but, unfortunately, subsequent investigation failed completely to verify Deutschmann's observations, and consequently the conclusions at which he arrived are now generally discredited.

All clinical experience, however, goes to support the theory that infection is necessary before a wound of one eye can be the cause of inflammation in the other, but there seems to be no reason whatever for supposing that a specific micro-organism is necessary to produce the disease. Difficult though it be, it is desirable to relate the pathogenesis of sympathetic inflammation to the present day knowledge of the pathology of inflammation as a whole, and if possible to place the one in line with the other. At the very outset, however, the peculiarities of structure and of function existing between the two eyes must be emphasised, for it seems probable that many of the difficulties incident to such an endeavor will lessen considerable, when due importance is given to the close nervous and vascular connections subsisting between the one eye and the other. Of all the paired organs of the body the eyes are the most closely related, and so it is that the slightest injury to the one is almost immediately followed by sympathetic irritation of the other. Numerous experiments have conclusively demonstrated that irritation of the ciliary nerves on one side produce not only dilatation of the blood-vessels, but also increased secretion of albumen into the aqueous humor, of the other eye. But such nutritional disturbances, although they favor, will not of themselves set

up, inflammation, consequently there must, in addition to vaso-motor changes, be another factor present before true inflammation is excited. There can be no doubt that this other factor is the micro-organisms which have entered the eye at the time of the injury, or subsequently, through the perforation in the eyeball due to the accident. Every day, operation wounds are made in the eye, and if these be aseptic they heal without the slightest trouble, and give rise to no risk of sympathetic inflammation. When, however, an operation wound is infected, it is as liable as any other to set up destructive sympathetic irido-cyclitis, and should the wound be in the ciliary region disaster happens all the more readily. Up to this point the problem is quite simple, the real difficulty lies in demonstrating the channels of communication between the two eyes along which this micro-biotic factor finds its way. There are three such passages—the bloodvessels, the ciliary nerves, and the optic nerves. Some weeks usually intervene between the occurrence of the accident and the onset of the secondary trouble, and if there has been acute suppurative inflammation of the injured eye, there will probably be no sympathetic inflammation at all. This would imply that the condition of the "exciter" plays a part in originating inflammation in the "sympathiser" apart from the presence of micro-organisms. The kind of eye most likely to excite sympathetic inflammation is one in which the acute symptoms have become quiescent, but which is tender on pressure and beginning to shrink. If such an eye be enucleated, and, after hardening in preservative fluid, be bisected, it is seen that there has been a great outpouring of exudation from the iris and ciliary region, and that this has distributed itself behind the lens capsule to form in some cases a complete partition between the vitreous and the aqueous chamber. The terminations of the ciliary nerves are embedded in this exudation, which as time goes on begins to become organized, and, contracting, compresses and drags not only on the embedded nerves but also on the ciliary body and the anterior part of the chorioid and retina. In very acute cases the retina becomes detached completely, and extends like a fibrous cord between the inflammatory exudation in front and the optic nerve entrance behind. In some cases the ciliary nerves themselves show signs of neuritis, and in all a constant

irritation is kept up by the traction produced by the shrinking exudation. As a result of this, vaso-motor disturbance is set up, and maintained, in the second eye, and this renders it all the more vulnerable. The "exciter" produces this disturbance in the "sympathiser" partly through ciliary neuritis, but mostly through reflex action; and the destruction of the ciliary nerves in panophthalmitis explains why no such change occurs after acute suppurative inflammations.

It now remains to trace the course of the infection which may be either the micro-organisms themselves, or the toxins which they have manufactured. Obviously the most direct road for microbes to pass from one eye to the other is along the optic nerves, connected by the chiasma and along the lymph channels surrounding them, but that they take this road has not so far been proved by experiment, and clinical experience does not bear it out. In abscess of the orbit, where both optic nerve and its lymphatics are implicated, sympathetic inflammation never occurs. Moreover, if the infection travelled along the optic nerves the occurrence of papillitis ought to be the first sign of the disease in the sympathising eye; but that is the exception to the rule in sympathetic inflammation; it is the ciliary region which is first attacked. It would appear then that the infecting influence, be it microbe or toxin, reaches the sound eye through the blood stream, and that its virulence is concentrated locally upon the eye owing to the special vascular arrangements, and to the lowered resisting power of the ocular tissues. This last is due, in the sympathising eye, to vaso-motor disturbance in the vessels of the uveal tract brought about by the irritation of the ciliary nerves of the injured eye. Why then is the sympathetic inflammation so intractable, and why does it proceed after enucleation of the "exciter?" It is true that once sympathetic inflammation has begun it pursues its destructive course quite uninfluenced by the injured eye. The part sympathetically attacked is usually in the first instance the ciliary processes, and it is upon the integrity of these that the nutrition of the eyeball for the most part depends. Whenever therefore they are seized in the grip of a plastic inflammation the whole plan for the nourishment of the eye becomes upset, and the disease necessarily goes from bad to worse. The close anatomical and functional relation between the two eyes and the delicate and

peculiar anatomical structure of the ocular tissues have much to do with the clinical peculiarities of sympathetic inflammation, for after all a morbid process is the same no matter what part of the body it attacks, and the results of a morbid process, while no doubt determined to a certain extent by the specific nature of the exciting cause, are also largely dependent on the anatomical structure of the organ attacked. If this view be correct there is no need to identify a specific micro-organism as the exciting cause of sympathetic inflammation, for any of the infective organisms found in wounds may produce it. Although different cases may present somewhat different clinical pictures, the special characters of the disease as regards onset progress, and termination, are the result of ordinary pathological processes working in organs united to each other in the most intimate manner, and whose individual anatomical structure is wholly unlike that of any other organ of the body.

It is no wonder that a disease so insidious in its onset, and so destructive in its progress, should prove most intractable to treatment, and it must be admitted that after sympathetic inflammation has fairly begun practically nothing can be done to check its progress, or to repair the damage which it has caused. The most effective treatment then must be prophylactic, and we know that in the stage of irritation, and even in the early stage of serous irido-cyclitis in the "sympathiser," the removal of the "exciter" is followed by most beneficial results. Much of necessity depends upon the manner in which the injured eye has been treated immediately after the accident, and in the lecture on penetrating injuries of the eye ball* a full description has been given of how eyes seriously injured may be saved, and sympathetic inflammation prevented. In many cases, however, enucleation is inevitable, and the following rules may serve as a guide:

1. Enucleate at once when the injury is so severe that the exciting eye is destroyed hopelessly from the beginning.
2. Enucleate at once on the slightest sign of sympathetic irritation should the vision of the exciting eye only equal a perception of light and darkness.

*Postgraduate lecture delivered in the Ophthalmic Institution on 9th December, 1902.

3. Enucleate at once if a foreign body is present in, and cannot be removed from, the exciting eye.

4. Enucleate at once when an injured eye is blind and suffering from recurrent attacks of acute inflammation, or when it is tender and irritable as a result of the onset of degenerative changes—*e. g.* ossification of the chorioid.

5. Do *not* enucleate when there is still sight in the injured eye, and when there is no sign of sympathetic disturbance in its fellow.

6. Do *not* enucleate when sympathetic inflammation is in progress and there is still sight in the injured eye, for under these circumstances the removal of the "exciter" will have no beneficial influence, and the probability is that in the end all the sight the patient will possess will be in the primarily injured eye

Optico-ciliary neurotomy, simple evisceration, and, as suggested by Mules, evisceration and the implantation of a glass ball within the sclerotic, have all been proposed as substitutes for enucleation, but undoubtedly the last is the safest operation from the point of view of prophylaxis, and the increased cosmetical results claimed for the substitutes may be got after enucleation if the capsule of Tenon be filled with melted paraffin, over which the recti muscles and the conjunctiva are carefully sutured.

In the treatment of the sympathetically affected eye, no operation ought to be attempted until all acute symptoms have subsided, for any attempt to perform a sclerotomy, or to excise a piece of the iris, even if successful at the time, is followed by an accentuation of the symptoms, and by increased outpouring of inflammatory exudation. At the outset we must rely on the treatment suited to cases of chronic irido-cyclitis. The eyes must be kept at rest, and this is best accomplished by shading them from the light and instilling atropine. If the inflammation be accompanied by great intolerance of light, lacrimation, and tenderness on pressure over the ciliary region, repeated leeching is useful in the early stages, but in the later, blisters or the insertion of a seton in the temple are of more value. Turkish baths are always helpful, but the number and frequency of these must be regulated by the patient's ability to stand them. Pain must be relieved by the local application of heat, and by the judicious use of opiates, aspirin , or other sedatives. In all

cases the one drug to rely on is mercury, and this must be given until its physiological effects become apparent. It may be administered by the mouth, by subcutaneous or subconjunctival injections, by the calomel vapor bath, or by inunction. Of all these the last is probably the best, and a half to two drachms of mercury-vasogen should be rubbed well into the skin of the temple and brow every night. The action of the mercury is intensified by iodide of potassium, which may be given in 10 or 20 grain doses once a day after meals. It is very important, however, during this severe antiphlogistic treatment to attend carefully to the patient's general health. He must be well fed, and appetite promoted by tonics, especially those containing quinine and iron. In a few cases recovery of sight may take place as a result of this treatment, but as a rule the most that can be hoped for is that the active symptoms will subside, leaving the iris firmly adherent to the capsule of the lens, which in all probability is now cataractous. After a sufficient time—a year or eighteen months—has elapsed, and if, during that interval, there has been no recurrence of inflammation, the intra-ocular tension has not diminished, and the patient's perception of light be satisfactory, operative interference may be considered. Should it be resolved on the iris should as far as possible be left alone. The lens must be got rid of, either by needling in the manner suggested by Critchett, or, in more favorable cases by drawing it off with a curette after the toughened capsule has been divided with a knife. Once the cataract has been removed, an iridotomy may open up the pupil sufficiently to allow light to enter the eye, and enable the patient to see as well as the damaged state of the retina will permit. In operating on such eyes, it must always be remembered that the vitreous is quite fluid and escapes readily, therefore it is important that all incisions be as small as possible and made wholly in the cornea. After operation the eye must be carefully bandaged and the patient kept quiet in bed in a dark room, while the local application of ice, and the administration of sedatives internally, will do much to prevent the occurrence of inflammatory reaction.

THE VISUAL REQUIREMENTS OF ENGINE MEN,
BASED ON PERSONAL OBSERVATIONS
FROM AN ENGINE CAB.*

BY H. B. YOUNG, M. D.,

BURLINGTON, IOWA.

I presume that all of you are aware in a general way that the House of Delegates of A. M. A. at the meeting in Saratoga last year, endorsed and promulgated resolutions from the Section of Ophthalmology, touching upon the need of systematic examinations of the sight and hearing of railway employees, and naming minimum standards of excellence to be required. That you should remember these resolutions in detail is hardly to be expected, save and excepting those of you who have been called upon to do something in this line of work.

For the purposes of this paper, however, it suffices to repeat only that part referring to classification, namely: "Employees to be divided into two classes.

Class A. Engine men, train men (excepting baggage men) signal men and switchmen.

Class B. Track foremen, bridge men, gatemen, crossing guards, telegraph operators, station agents and baggage men.

For the former the standard should be 20/20 in each eye separately without glasses.

For the latter not less than 20/40 in the worst eye, with allowance for glass wearing, provided an extra pair was carried on the person.

Both classes to have perfect color vision."

What heed will be given by R. R. officials to these recommendations time will tell. For the present—at least until a new generation of employees can be trained, it will manifestly be impossible to have them adopted in their entirety, even on roads that have done something along this line for as much as ten years past. It takes time to make a thoroughly

*Read at the meeting of the Chicago Ophthalmological and Otological Society, Oct. 13, 1903.

competent engineer, and to immediately set aside all those who do not come up to the standards named would be to cripple the service materially and render life and property in transit more insecure. In this connection it may even not only be questioned whether the innumerable good records of those enginemen who do not come up to these standards are the results of lucky chance, but as well whether these good records do not of themselves show that somewhat lower standards may be compatible with safe and effective service.

Other things being equal, it is unquestioned that in old as well as new men, 20/20 is desirable. But 20/15 which is not unusual in the masses, is better than 20/20; and when something short of the best is to be accepted, the practical relations between the work required and the vision needful for it should be considered. To say that no man can safely run an engine unless he has 20/20 is to make a declaration more arbitrary than exact. For the man who has 20/15 will say that "The 20/20 man has defective vision;" and the men with 20/30 or 20/40 are not lacking who will say that they "have run trains for 20 years and never missed a signal nor read a signal wrong."

What degree then of vision does an engine man require to safely perform his duties and how shall it be determined?

This question was brought to me in a practical way last year by having to pass upon the fitness of an old Burlington engineer to continue on his run on one of the fast trains. By the test card he had 20/30 in one eye, 20/40 in the other. With astigmatism corrected, almost 20/20 in one eye, 20/40 + in the other. But when I tried to apply these findings to railroading, looking for semaphore arms which if seen at one half mile in clear weather, plus good back grounds, meant 20/20, I found myself in a maze of conjectures. Bad weather and bad backgrounds which had to be taken into account complicated the situation still more and for lamp signals at night there was no application at all. Nothing remained therefore but to put myself in his place; and so I undertook upon myself from the engine cab a series of observations which extended over several months and involved about 1000 miles of travel day and night and in all kinds of weather. To make comparisons I took with me the lenses which by first testing myself in the office I found would give me at will exactly and no more 20/20 and 20/40 in a clear atmosphere and good light. The

results of these observations it is my purpose to give you now in as brief a manner as possible. Needless to say that these observations are the basis for whatever opinions I hold upon the questions involved.

First, as to the effects on 20/20 of the strain of the occupation and then of unfavorable weather conditions.

Some Frenchman I believe has declared that the draft on the visual powers is such that after a run of 100 or 200 miles an engineer who started with 20/20 will do well to show 20/30. I can only say that I was not so affected by the greater distance, and the statement must thus be open to question.

The unfavorable weather conditions are fog, rain and snow. Fog of course may be so dense that signals are invisible until one is directly under them; and the same may be said of rain or snow. But the two latter in moderation make trouble because they cloud the windows and when the head is put outside, the impact of the drops and crystals is so fierce and painful on the eyes that the tears quickly flow and the lids cannot be long held open. At night something also depends on the kind of headlight used. In snow, paradoxical as it may seem, the stronger the light the worse off you are. The electric headlight which is such a good thing in many ways in clear weather, is so powerful that the reflections from the snow crystals are sufficient to give the effect of a fleecy cloud or white veil as wide as the rays extend, floating apparently some 50 or 100 yards in front of the engine and through which the lamp signals are much reduced in brilliancy. It has seemed to me that if smaller parabolic reflectors were used, or the light stopped down to a pencil ray through a diaphragm, much of this cloud would be dispelled and in a clear atmosphere the light of an approaching engine would not be so blinding. I aim to have it tried.

Second, as to what one sees with 20/40 in good weather. It is difficult to say definitely. The lamp signals at night, for manifest reasons, can be seen at much greater distances than the semaphore arms by day. How far I do not know; but I know that I was able to make out the green tail lights of a train approaching on the other track (The Burlington is mostly double track) at a distance estimated by the train men at two miles. The red lights for some reason unaccountable to me unless there is fault in the coloring of the red

glass, do not seem to have as much penetration as the green, but there is no difficulty in seeing them a mile away.

And here I must speak of another apparent paradox. The lamp signals stand out better with 20/40 than with 20/20. This is explained when one considers that with 20/20 the effulgent rays can be made out. These effulgent rays give a twinkling unsteady effect which is still farther accentuated by the jolting of the engine. With 20/40 these effulgent rays are blotted out and the lamps stand out as illuminated discs.

For the semaphore arm by day we can figure in this way. At half a mile as 20/20 it occupies the 5' visual angle in its long diameter and 1' in its short diameter. Taking 20/40 as only one-half as good vision as 20/20 — which is certainly a moderate allowance, seeing that the semaphore arm is more easily deciphered than the letter on the test card, it should be easily seen at one-quarter of a mile—which it certainly is. The question now naturally arises. Is this good enough? If we accept the estimate of train men that an eight-car, 60 miles an hour express train, properly equipped can be stopped without damage within a space of 1200 feet the answer must be in the affirmative, for there remains yet 120 feet to spare. During the tests in Burlington in 1886 with a 50-car freight train at 40 miles per hour a stop was made in 600 feet, but not without some damage to the contents.

Third, as to the wearing of glasses:

According to my observations the man with 20/30 or 20/40 does not absolutely need them; but is there any good reason why he should not wear them if he wants to?

Possibly I look upon this feature with prejudiced eyes for I must wear glasses for all purposes. But we know that the steamboat pilot is not only allowed but expected to keep a powerful binocular ready for instant use; while you and I as surgeons are trusted in matters of life and death to do things with glasses when without them we would be powerless. Nor can the old-time popular feeling that glass-wearing indicated poor vision be longer urged, because the public within the last decade has been brought to know that it means less fatiguing more often than better vision.

In wind, dust, and falling weather, glasses are certainly a great protection to the eyes in rail-roading, and the question of fogging may be dismissed if we only stop to consider that fogging only occurs when going from a

cold air into a warm one. Rain and snow may dim them but they can be more quickly and perfectly cleaned than the cab window. Some engineers rig up small glass screens outside the cab windows as wind and weather breaks; but protective glasses would give more range and be as easily handled. While we are upon this subject two additional features about glass wearing must not be overlooked. On the old established roads the average man does not get to be an engineer much under 40 years of age. At 45 he will hardly escape the use of glasses for reading his train orders and the time on his watch dial. Then again recent investigation seems to show that astigmatism against the rule is developed by the occupation—the continued peculiar compression of the lids tending to this result.

If glasses are to be prohibited, the life of an engineer as an engineer may thus become so short that men will think it hardly worth while to serve the apprenticeship.

Finally, as to the methods of examination. And let me say at once that these should be as much on the ground as possible. I mean by this that while the test card and special color lantern are not without their uses, the tests in unfamiliar surroundings and with materials which the employee has never seen before and may never see again should not be given too much prominence.

We have long since learned that when people come to be fitted with glasses for reading or close work, the conclusive test is with the type or material to be worked upon and not with that newfangled apparatus, which, the inventor maintains, is constructed on correct mathematical formulae, and therefore must give more accurate findings. So with tests for railroad men I believe it to be better to depend more on tests with those things which they will be expected to see in their everyday work in the yards and along the lines.

It must also be remembered that vision is a complex act; and that some people with 20/20, because of slower or duller mental perception may have poorer practical vision than some others with 20/30.

In apprentices the highest type of vision should be required, but this rule will be just as effective if unwritten, and nothing is lost by failing to make use of the expression—"normal vision."

The cordial assistance of Mr. J. F. Deems, formerly Supt. of Motive Power C. B. & Q. R. R., now of the New York Central, and Mr. J. A. Carney, Master Mechanic at West Burlington, should be recorded.

THE INFLUENCE OF RESECTION OF THE CERVICAL SYMPATHETIC GANGLIA IN GLAUCOMA.*

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EAR INFIRMARY.

(ILLUSTRATED BY 25 DRAWINGS AND 4 PHOTOGRAPHS.)

This paper does not pretend to be a treatise on the subject mentioned in the title, nor does it assume to give any positive conclusions as to the value of the operation of sympathectomy in glaucoma; for, it may be said at the outset, that despite the study of almost all the literature on the subject in its preparation, and the collection of published and unpublished data in this country, I feel that positive conclusions are not yet to be reached, and I can only offer this as a contribution that may possibly aid in future work.

I wish at first to express my sincere thanks to ophthalmologists of the country who so generously responded to the letter asking for data concerning cases of excision of the sympathetic ganglia for glaucoma, and for the latest possible reports of the condition of such cases.

In this way it has been possible to secure records of almost all the cases of glaucoma treated by this means in this country. In several instances the reports seem so favorable that one is tempted to draw general conclusions, while in others the data are so meager or the time that has elapsed since the operation is so short, that positive deductions are unwarrantable. Such reports would be more valuable if in

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every instance careful clinical records had been kept together with charts of the visual fields. Nothing is more important in the study of chronic glaucoma than the condition of the peripheral vision, and such record in a number of these cases is lacking.

I desire first to present a detailed report of seven cases of sympathectomy for glaucoma in my own practice, which are still under observation, two of which are rather recent.

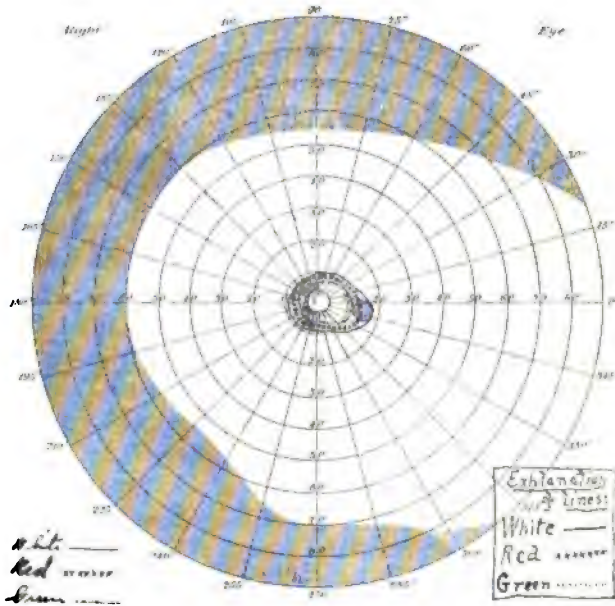


Fig. 1. Case 1. Before sympathectomy. Felix H., aged 40. Chronic inflammatory glaucoma. April 29, 1901. Right eye. V. = 20/50. T +. Good illumination. Object 1 cm. sq.

I shall then give an abstract of the records of cases of sympathectomy for glaucoma that have been done in this country, as they were furnished to me by the observers in answer to the circular letter sent out this spring. Some of these cases have already been published but the observers have kindly sent me the latest possible report on the condition.

CASE 1. CHRONIC INFLAMMATORY GLAUCOMA, RIGHT EYE.
 SYMPATHECTOMY (NO BENEFIT). IRIDECTOMY
 (IMPROVEMENT).

Felix H., aged 40 years. Entered Illinois Eye and Ear Infirmary, April 29, 1901. Family history negative, and no previous history of eye trouble until April, 1898, when he lost the sight of the left eye by having it struck with a piece of hot brass. He could see shadows with it until one year before admission. Some three weeks after the injury to the

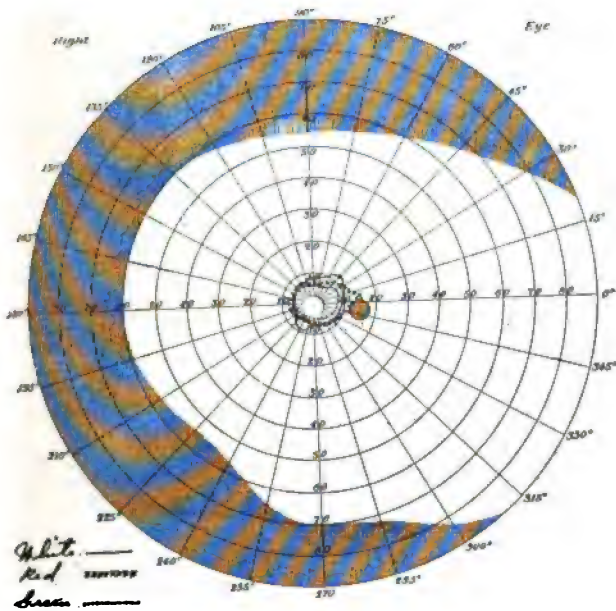


Fig. 2. Case 1. Three weeks after sympathectomy. Felix H. Chronic inflammatory glaucoma. June 17, 1901. Right eye. V. = 20/40. T +. Good illumination. Object 1 cm. sq.

left eye, the right eye became inflamed, and he states that he was unable to see with it for two or three weeks, and then he recovered vision. In the last two months he has noticed failure of vision, with occasional pain in the right eye. Halos have been noticed around a light. On admission R. E. V. = 20/50 c Cyl. + 1.50 ax. 180° slight improvement. Conjunctiva of right eye injected and there is engorgement of the ciliary vessels. Pupil moderately dilated and ver-

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tically oblong. Responds to light. T +. Optic disc distinctly excavated, but no pulsation of the vessels. L. E., V. = O. Conjunctiva injected; pupil dilated; cataract. T + 1. No perception of light. Fundus not visible. Eserine grains ii— $\frac{1}{2}$ i was used three times daily, and the pupil became somewhat smaller and the tension less. For visual fields see Fig. 1, which shows marked contraction in all meridians.

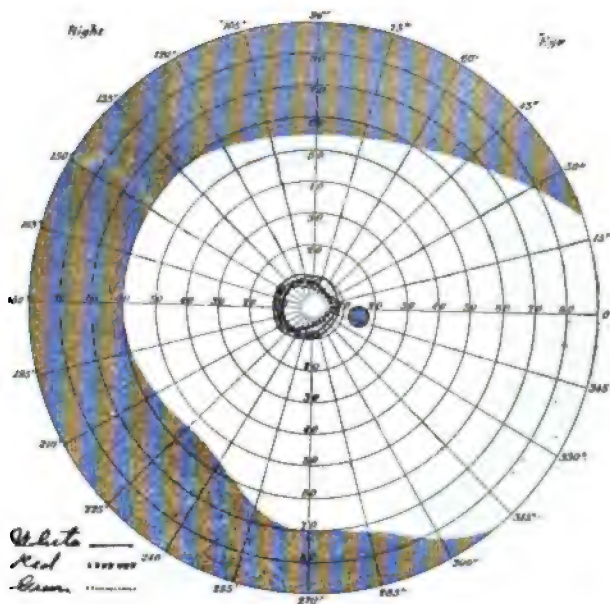


Fig. 3. Case 1. Five weeks after iridectomy. Felix H., aged 40. Chronic inflammatory glaucoma. Aug. 29, 1901. Right eye. V. = 20/30 +. Tn.

May 16, 1901. R. V. = 20/70 \bar{c} Cyl. + 1.50 ax. 180° through stenopaic slit 20/50. Severe pain last night. A. C., shallow. T + 1. Pupil dilated 5 mm. In the afternoon of this day under chloroform narcosis, Dr. F. C. Schaefer removed the right superior cervical sympathetic ganglion. Contraction of the pupil immediately followed, but tension was not lowered until several hours after the operation. At the time of the operation there was neither pallor nor flushing of the face, nor was there an increase of lacrimal secretion. Ptosis of right side was noticed after recovery of consciousness.

May 17, 1901. Patient comfortable, right pupil contracted. T. lower than before but still +.

May 18, 1901. Considerable headache. Pupil contracted. T +.

May 20, 1901. Considerable pain in wound and head. T. slightly +. R. V. = 20/40.

There was some infection of the wound but by June 7th, it had completely healed and patient had no more pain, and also no headache. The slight improvement in central vision continued at 20/40 and the tension was only slightly in-

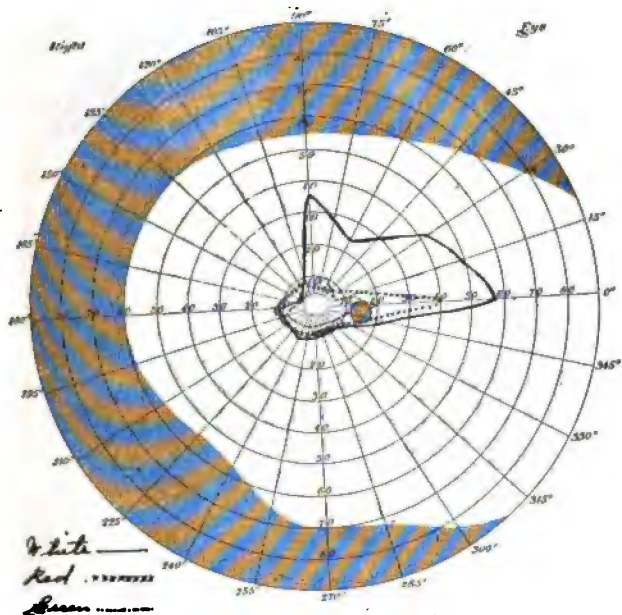


Fig. 4. Case 2. Edward V., aged 62. Chronic inflammatory glaucoma. June 29, 1901. Right eye. V. = 20/100. T +. Object 1 cm. sq.

creased. The fields, however, showed no improvement (Fig. 2).

June 13, 1901. Vision fell to 20/70 with an increase of tension. This was not controlled by eserine.

June 20, 1901. Tension has been elevated for one week and there has been occasional pain in the eye. Large iridectomy done upward.

June 22, 1901. Very slight reaction from iridectomy.

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July 2, 1901. R. V. = 20/100. Tension normal. No pain. Central vision began to improve, but occasionally there was slight pain in the eye and slightly increased tension.

From Aug. 2, 1901, to date of his discharge, Aug. 29, 1901, the tension remained normal and the eye was quiet. R. V. with Cyl. + 1.00 ax. $20^\circ = 20/30 +$. Visual fields were unchanged (Fig. 3).

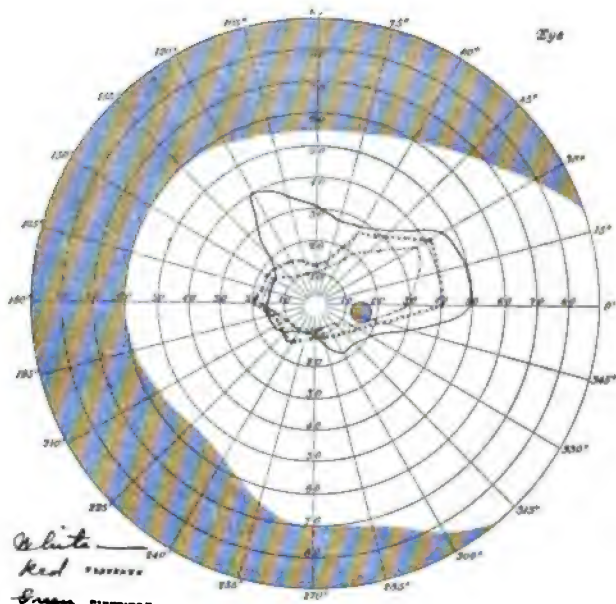


Fig. 5. Case 2. Eighteen days after sympathectomy. Edw. V., aged 62. Chronic inflammatory glaucoma. July 30, 1901. Right eye. V. = 20/40 +. Tn. Object 1 cm. sq.

CASE 2. CHRONIC INFLAMMATORY GLAUCOMA. BOTH EYES. RIGHT SYMPATHECTOMY (MARKED TEMPORARY IMPROVEMENT). IRIDECTOMY.

Edw. L. V., aged 62 years, entered Illinois Eye and Ear Infirmary, June 29, 1901. No history of previous eye disease. History of rheumatism. Father became blind at the age of 70 years. Examination of urine shows nothing abnormal. About five years before, patient noticed he would occasionally see rings of color around a light, but it was not until

six months before admission that he commenced to have pain in his eyes which he describes as dull, persistent and centering over the left eye. He has noticed a gradual failure of vision, and at different times a complete loss of vision in different fields. There is a history of an acute exacerbation three weeks ago, since which time he has had more trouble. Patient hyperopic.

R. E. V. with Sph. + 5.00 = 20/100 +.

Cornea clear, not anesthetic. A. C., shallow. Some cir-

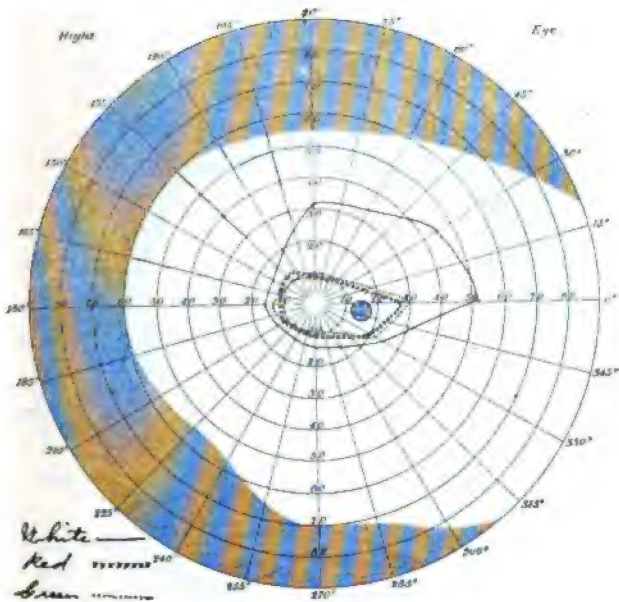


Fig. 6. Case 2. One month after sympathectomy. Edw. V., aged 62. Chronic inflammatory glaucoma. Aug. 8, 1901. Right eye. V. 20/30. Tn. Object 1 cm. sq.

cumcorneal injection. Pupil not dilated, responds feebly to light. T +. Lens slightly cloudy. Disc deeply cupped with glaucoma halo.

L. E. V. with Sph. + 5.00 = fingers at 5 ft., in temporal field. Pupil normal in size. T +. Some opacity of crystalline lens. Disc deeply cupped. For fields of right eye see Fig. 4. It was impossible to chart the field of vision of the left eye.

Eserine grs. ii-3i t. i. d. was used in each eye.

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Operation July 12, 1901. Under ether narcosis, the right superior cervical sympathetic ganglion was removed by Dr. F. C. Schaefer. The operation was successfully and easily performed and the patient bore it well. Soon after the operation it was noticed that the right pupil was contracted, there was ptosis and the tension was about normal.

July 16, 1901. R. V. with Sph. + 5 = 20/50. Pupil small. T +.

July 17, 1901. R. V. with Sph. + 5 = 20/70. Pupil small. T +.

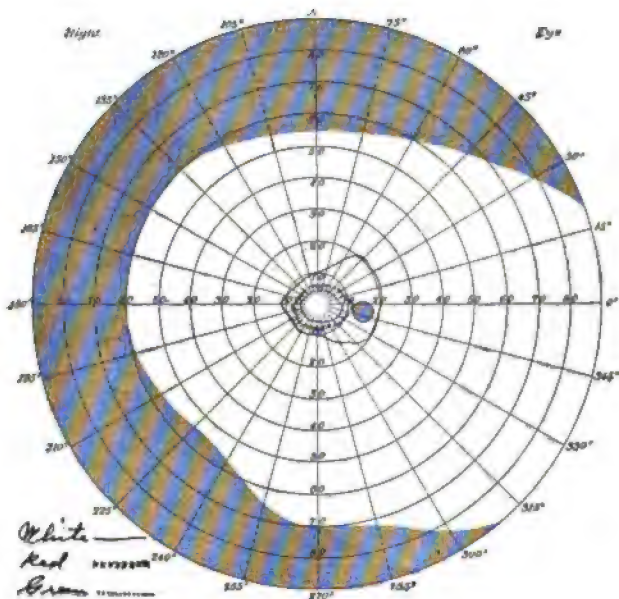


Fig. 7. Case 2. Fourteen weeks after sympathectomy. Edw. V., aged 62. Chronic inflammatory glaucoma. October 26, 1901. Right eye. V. = 20/70. T + 1. Object 1 cm. sq.

Wound in the neck healed by first intention and patient experienced no ill effects from it. Vision began to improve, although tension remained slightly increased.

July 30, 1901. R. V. c Sph. + 5.00 = 20/40 +. Fields increased (Fig. 5). Tension is also nearer normal.

August 8, 1901. R. V. c Sph. + 5.00 = 20/30, Tension normal. Field (Fig. 6).

August 31, 1901. He left the hospital against my advice.
Tn. R. V. = 20/30. Field as above.

October 26, 1901. Readmitted to the hospital. R. V. \bar{c}
glass = 20/70. L. V. \bar{c} glass = fingers at 6 in.

Tension of right eye decidedly plus. The impairment of
central vision is probably due to increasing cloudiness of the
central portion of lens. The left lens was much more opaque
than when he left the house in August. The visual fields of
the right eye had become markedly contracted as seen in

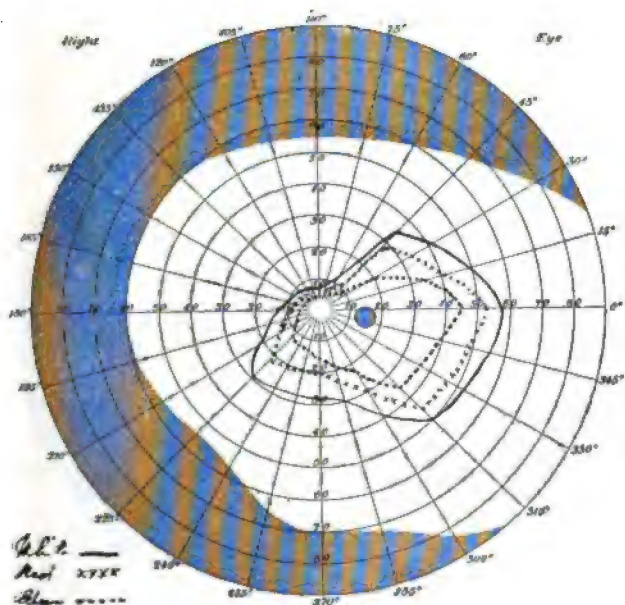


Fig. 8. Case 3. Dr. J. H., aged 46. Simple glaucoma. Nov. 16,
1901. Right eye. V. 20/200. T + 1. Object 1 cm. sq.

Fig. 7. As the tension remained high I did an iridectomy
on the right eye Nov. 14, 1901, followed one week later by an
iridectomy on the left eye. Although the operation was
easily performed and without accident or complication, it
had the effect of causing the opacity of the lens to increase
more rapidly. The tension returned to normal and patient
left the hospital December 6, 1901. R. V. = 15/200. L.
V. = shadows.

He promised to return as soon as the cataract in the right

eye made him helpless, but although I have endeavored to find him, I have not seen him since.

CASE 3. SIMPLE GLAUCOMA, BOTH EYES. LEFT SYMPATHECTOMY (WITHOUT BENEFIT). LEFT IRIDECTOMY (WITH QUESTIONABLE BENEFIT).

Dr. John H., aged 46, consulted me Nov. 15, 1901, referred by Dr. A. E. Prince, Springfield, Ills. General health good. At the age of 20 he had granulated eyelids, from which he

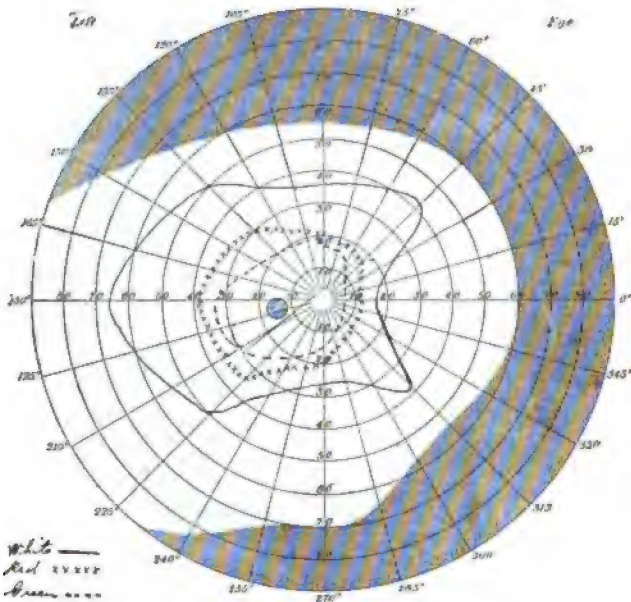


Fig. 9. Case 3. Before sympathectomy. Dr. J. H., aged 46. Simple glaucoma. Nov. 16, 1901. Left eye. V. = 20/200. T + 1. Object 1 cm. sq.

suffered for two years, recovering completely. No trouble of eyes since that time until January, 1901, when his eyesight began to grow dim, and he would occasionally see halos around a light with the left eye. These attacks of dimness of vision during which he seemed to be looking through a "fog or a haze," came on at intervals of five or six days, and lasted several hours. There was no pain, redness or tenderness of the eyes during these attacks or during the intervals.

He noticed that his sight was usually clearer in the morning than in the afternoon.

Four weeks before coming to me, he consulted Dr. Thompson of Indianapolis, who pronounced his case glaucoma and prescribed eserine, which he was using at the time. Condition at time of first examination, Nov. 15, 1901.

R. V. \bar{c} Sph. + 2.00 \ominus Cyl. — 3.50 ax. $180^\circ = 20/200$.

L. V. \bar{c} Sph. + 4.00 \ominus Cyl. + 3.00 ax. $75^\circ = 20/200$.

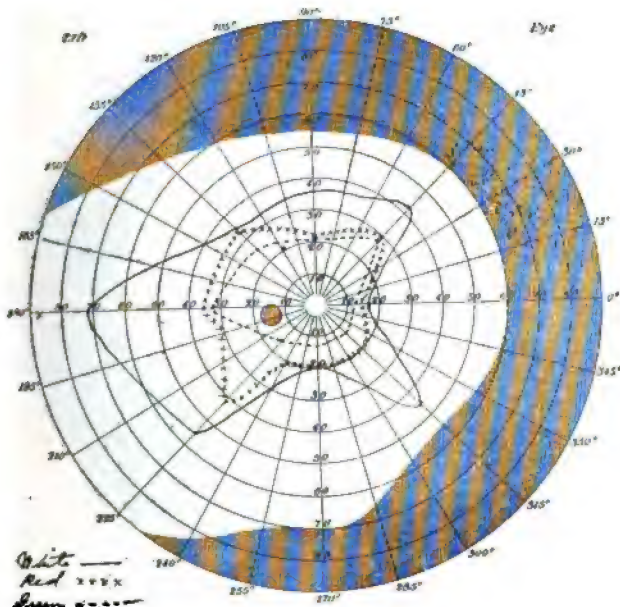


Fig. 10. Case 3. Five weeks after sympathectomy. Dr. J. H., aged 46. Simple glaucoma. December 30, 1901. Left eye. V. = 20/200. Tn. Object 1 cm. sq.

He was wearing such lenses constantly. Both pupils small and somewhat irregular and do not respond to light. Tension of each + 1.

On discontinuing the use of the eserine for one day, the pupils dilated moderately so that the fundus could be seen clearly. There was a deep glaucomatous excavation in each disc. The fields (Fig. 8 and Fig. 9) taken Nov. 16, 1901, showed marked contraction in the nasal region, that of the right noticeably so. The anterior chamber was about of normal depth. After discussing the question of operation

with the patient, it was decided to do a sympathectomy on the left side. Nov. 20, 1901, the left superior cervical sympathetic ganglion was excised by Dr. Schaefer at the Post Graduate Hospital under chloroform narcosis. The operation was successfully performed. Immediately after the operation the left pupil which had been without eserine for two days and was moderately dilated, contracted, and the tension became normal. The patient recovered nicely from

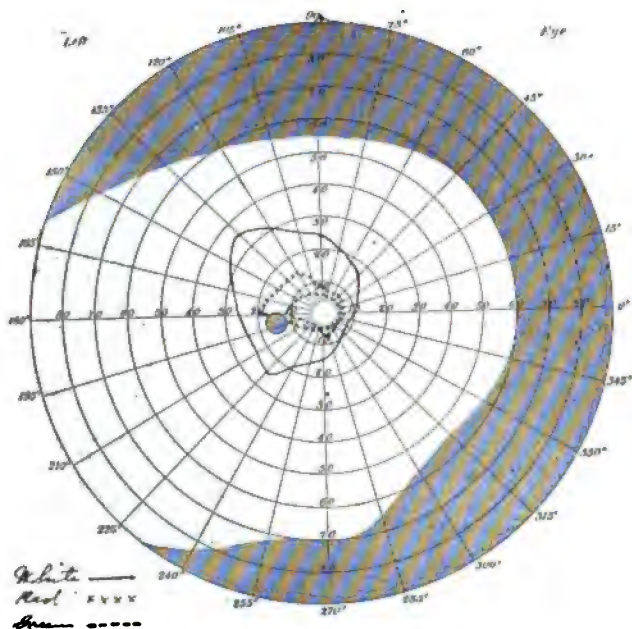


Fig. 11. Case 3. Three months after sympathectomy. Dr. J. H., aged 46. Simple glaucoma. Feb. 12, 1902. Left eye. V. = 8/200. T +. Object 1 cm. sq.

the operation, but had some sensitiveness of the left side of the neck and face and inability to raise the left arm and shoulder. He was also quite hoarse, and this symptom persisted.

Dec. 1, 1901. L. V. \bar{c} Sph. + 4.00 \ominus Cyl. + 3.00 ax. 75° = 20/200. Tn. Pupil small. Ptosis of left. Fields show no increase.

R. V. \bar{c} Sph. + 2.00 \ominus Cyl. — 3.50 ax. 180° = 20/200. Pupil small from pilocarpine. Tn. sometimes +.

Dec. 30, 1901. Condition same as on Dec. 1. Color fields slightly enlarged (Fig. 10). He left the city with instructions to continue the miotic and to report at once if his sight began to get worse.

Feb. 12, 1902. Patient returned with the statement that his sight was failing. R. V. \bar{c} glass = 10/200. L. V. \bar{c} glass = 8/200. Pupils moderately contracted. T +. Fields of left contracted as shown in Fig. 11.

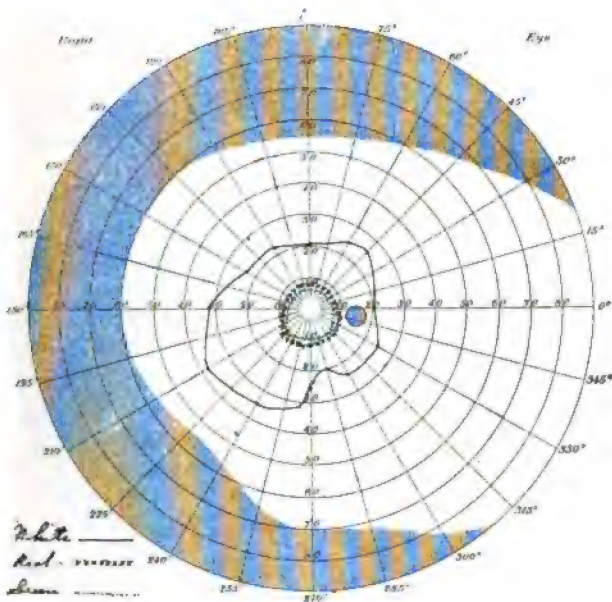


Fig. 12. Case 4. Christian K., aged 74. Simple glaucoma. Oct. 7, 1902. Right eye. V. = 20/70. T +. Object 1 cm. sq.

Feb. 14, 1902. Broad iridectomy upward in left eye. The eye made a good recovery from the operation.

Feb. 24, 1902. R. V. \bar{c} glass = 15/200 Tn.

L. V. \bar{c} glass = 6/200 T —.

Patient is somewhat hoarse and has imperfect power of the left shoulder. He left Chicago for his home in southern Illinois. He continued the use of pilocarpine.

A letter from him written April 19, 1903, tells me that he has R. V. \bar{c} glass = 13/200. L. V. \bar{c} glass = 9/200. The left vision, however, seems to be somewhat brighter than the right. He says the fields are limited upward and downward, but

fairly good to the temporal side. The tension in each eye is plus, that of the right being a little higher than the left. He says he never has the least pain or trouble in any way in the eyes and his condition is such that he "can get around with comparative comfort," and attend to his duties as postmaster, a position he obtained after giving up his practice. His voice is hoarse and weak and his neck in front of the scar is sensitive.

CASE 4. RIGHT SIMPLE GLAUCOMA. LEFT ABSOLUTE GLAUCOMA. RIGHT SYMPATHECTOMY (IMPROVEMENT).

Christian K., aged 74, admitted to Illinois Eye and Ear Infirmary Oct. 3, 1902. One year before he had severe pain

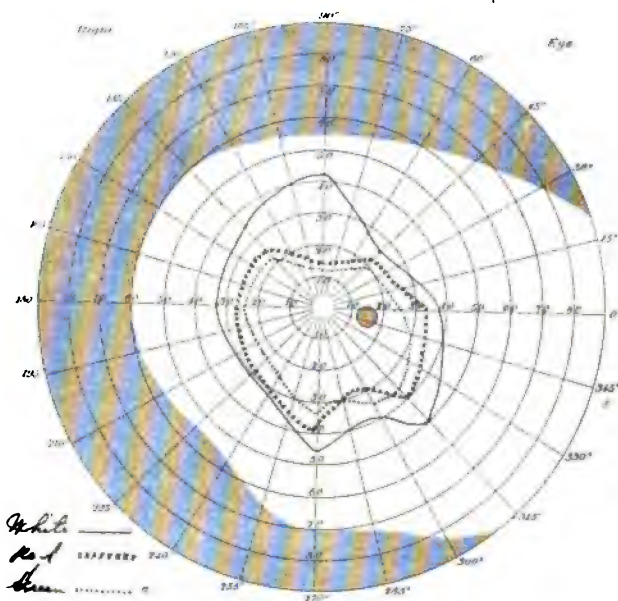


Fig. 13. Case 4. After one week of eserine. Christian K., aged 74. Simple glaucoma. Oct. 15, 1902. Right eye. V. 20/40. Th. Object 1 cm. sq.

in the left eye which lasted two weeks, and which was pronounced neuralgia by one physician who saw him, and another said his impaired vision was due to a developing cataract. Halos were noticed around a light, and the eye

was considerably reddened. The sight was very imperfect after this period of painfulness but the eye quieted down. Eight months later, he had a most severe attack of pain in the left eye which lasted two or three hours, after which he discovered that the eye was completely blind. This attack was pronounced neuralgia by the physician who saw him after it was over. Soon after this experience he noticed a fogginess of the vision of the right eye, more marked at times than at others. Halos were occasionally seen around lights,

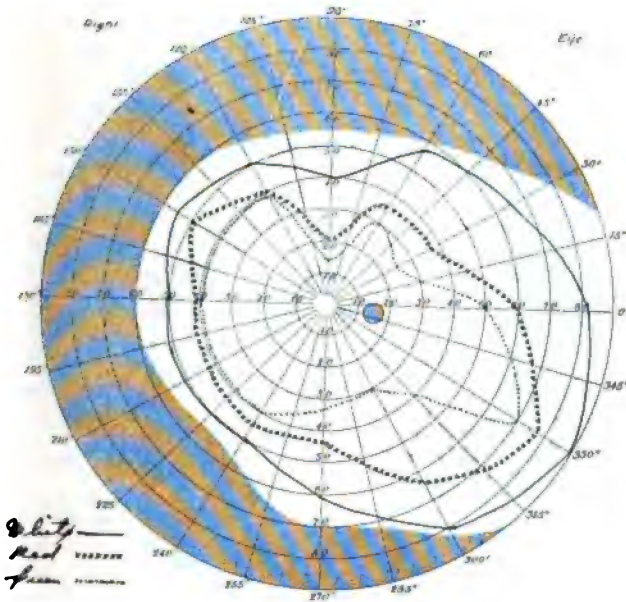


Fig. 14. Case 4. Two weeks after sympathectomy. Christian K., aged 74. Simple glaucoma. Nov. 5, 1902. Right eye. V. 20/40. Tn. Object 1 cm. sq.

but he had very little or no pain in the eye. He is a strong, healthy man with no history of previous disease. Urine normal.

On admission R. V. = 20/70, emmetropia. L. V. = O. Right eye T +, anterior chamber of normal depth, pupil not dilated and responds to light and accommodation. Optic disc not markedly cupped, but of a grayish unhealthy appearance with indistinct margin such as is seen in incipient glaucoma. Left eye, T + 3.

Marked pericorneal injection. Pupil moderately dilated and shows a greenish reflex. Fundus invisible. Diagnosis, right, simple glaucoma; left, absolute glaucoma. Eserine grs. i— $\frac{5}{16}$ twice daily for each eye. The first chart of visual fields, taken a few days after his admission, is seen in Fig. 12. This was not taken by myself and may be somewhat inaccurate for the next field, Fig. 13, taken on Oct. 15, 1902, after several days use of eserine, shows a considerably increased field; but as the central vision had improved to

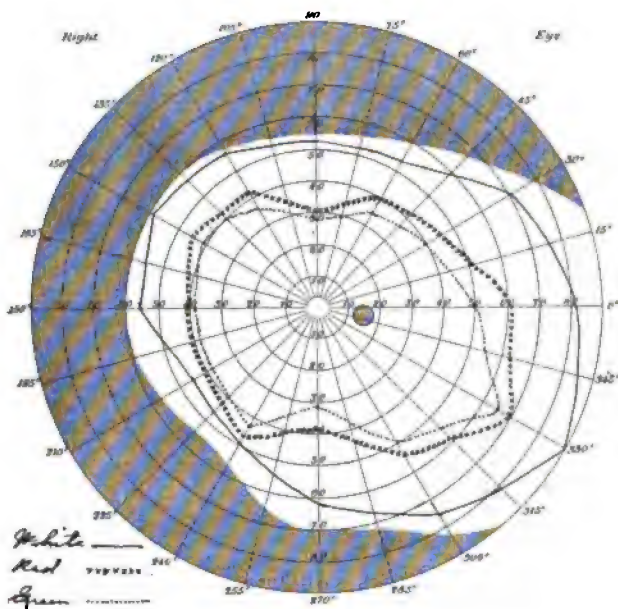


Fig. 15. Case 4. Eight weeks after sympathectomy. Christian K., aged 74. Simple glaucoma. Dec. 17, 1902. Right eye. V. = 20/40 + 2. Tn. Object 1 cm. sq.

20/40 from 20/70 and the tension had become normal after the use of the miotic; the improvement in the fields may probably be ascribed to the treatment. All the other fields were taken carefully by myself.

Oct. 20, 1902. Excision of the right superior cervical sympathetic ganglion was made by Dr. F. C. Schaefer, without any difficulty. Pupil became small immediately after operation, and tension became reduced. Ptosis followed, but

there was no pain about the face or neck and no congestion of the conjunctiva or skin.

Patient made an excellent recovery from the operation with no unfavorable symptoms. Slight ptosis of the right eye was noticed.

October 28, 1902. Pupil contracted. Tn. R. V. = 20/40.

November 5, 1902. Fields show a remarkable improvement (Fig. 14). R. V. = 20/40. Tn.

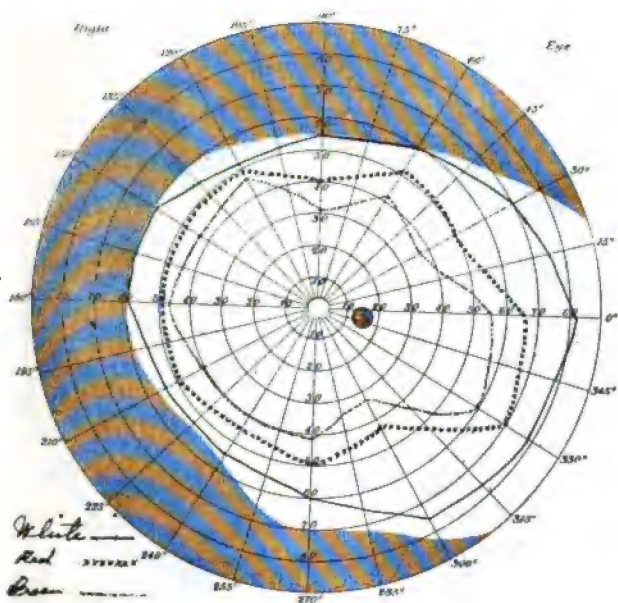


Fig. 16. Case 4. Six months after sympathectomy. Christian K., aged 74. Simple glaucoma. April 20, 1903. Right eye. V. = 20/40 +. Tn. Opjeet 1 cm. sq.

December 17, 1902. Improvement continues. Fields almost normal (Fig. 15). R. V. = 20/40 + 2. Patient still has some pain in right side of face and jaw, as well as the right auricle.

January 14, 1903. Left the hospital to-day. R. V. = 20/40 + 2. Tn. Pupil contracted. Field same as above.

April 18, 1903. Readmitted. In left eye there has been severe inflammation and ulceration of the cornea, which began two or three weeks ago.

R. V. = 20/40 +. Pupil still contracted and Tn.

Fields normal (Fig. 16). It will probably be necessary to enucleate the left eye.

CASE 5. SIMPLE GLAUCOMA, LEFT EYE. SYMPATHECTOMY. DISEASE STATIONARY.

J. S., aged 76 years. First consulted me Nov. 12, 1902, complaining that for weeks previously he had the sensation of a fog being over the left eye. He had also noticed halos around a light at night. This phenomenon of colored rings

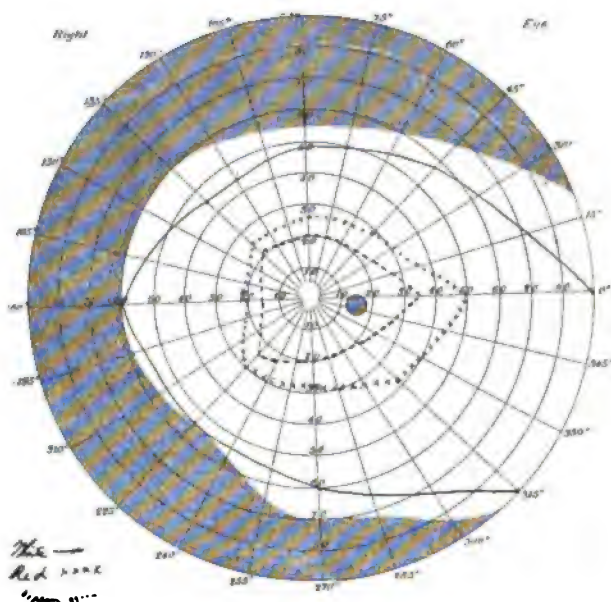


Fig. 17. Case 5. J. S., aged 76. Simple glaucoma. Nov. 13, 1902. Right eye. V. = 20/30 +. Tn. Object 1 cm. sq.

he had noticed at times for years, but he remembered that at such times there was usually a slight secretion from the lids. He also experienced at times a dull pain in the left eye, and the same, but less frequently, in the right. He stated that at one time he had severe neuralgic pains extending from the bridge of the nose, backward around the left orbit to the ear. General health good, except that he had at times indistinct rheumatic pains, and suffered from a bladder disturbance, probably on account of prostatic enlargement. He wears glasses.

R. Sph. + 1.50 Cyl. + 1.00 ax. 15°.
 L. Sph. + 1.75, for distance, and,
 R. Sph. + 5.00 \ominus Cyl. + 1.00 ax. 15°.
 L. Sph. + 5.00. for reading prescribed by an ophthalmologist a year or so before.
 R. V. = 20/100 \bar{c} glass 20/30 +.
 L. V. = 25/70 \bar{c} glass 20/30.
 Right tension normal. Left tension slightly plus, pupi, contracted with miotic, anterior chamber of normal depth

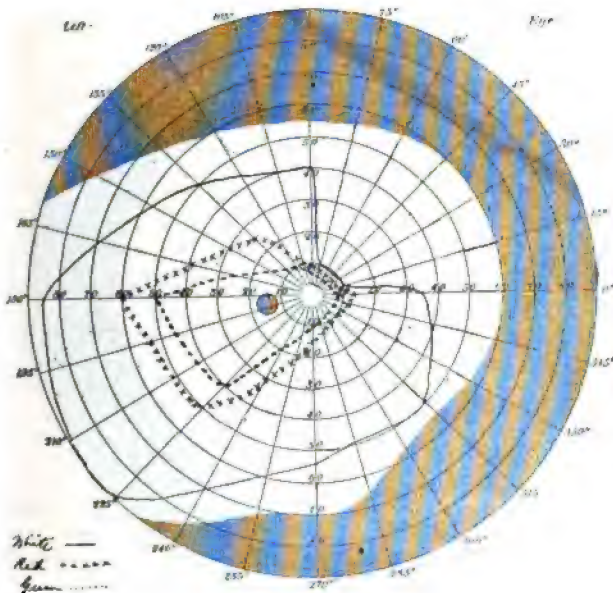


Fig. 18. Case 5. J. S., aged 76. Simple glaucoma. Nov. 13, 1902.
 Left eye. V. = 20/30. T +.

optic disc shows glaucomatous excavation, that of the right is normal. The chart of the right fields (Fig. 17) shows slightly contracted color fields. That of the left (Fig. 18) shows a scotoma in the upper nasal quadrant. Pilocarpine grs. ii- $\frac{3}{4}$ t. i. d. was ordered.

December 1, 1902. Tension has remained about the same as before under the use of pilocarpine. Pupil remains small and anterior chamber of good depth. L. V. \bar{c} glass = 20/30. Left fields show somewhat more contraction in the upper nasal quadrant (Fig. 19). .

December 2, 1902. At a consultation with Dr. Hotz it was decided to advise an operation. As the anterior chamber was of normal depth, and the fields have not improved under the continued use of a miotic, although the pupil was markedly contracted, it was thought that sympathectomy offered as good a chance of checking the glaucoma as iridectomy. The subject was thoroughly discussed with the patient and his family, and it was finally decided to try first the operation on the neck.

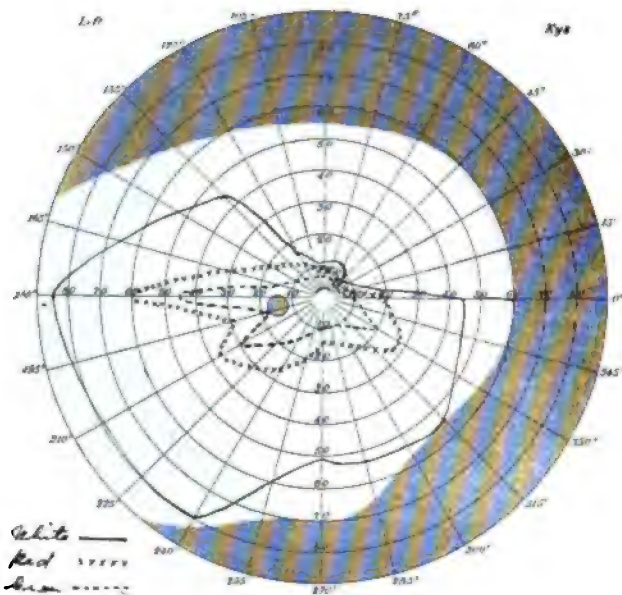


Fig. 19. Case 5. J. S., aged 76. Simple glaucoma. Dec. 1, 1902. Left eye. V. = 20/30. T +. Object 1 cm. sq.

December 6, 1902. Under chloroform narcosis, the left superior cervical sympathetic ganglion was excised by Dr. Schaefer in the usual manner. The pupil, which for the last few days had recovered from the influence of the miotic, contracted promptly after the removal of the ganglion. There were no accidents or difficulties accompanying the operation and the patient recovered well from the anesthetic. He had complete aphonia, and marked hoarseness continued for more than a week. There was suffusion of the left eye and some congestion of the conjunctiva, mucous membrane of

the left side of the nose, and skin of left side of the face, lasting for a couple of days. Ptosis of the left side was also noted. The patient was also confused mentally and at times had mild hallucinations, and did not remember where he was. This rather alarming symptom continued for about one week, and gradually disappeared. There was tenderness about the angle of the jaw, and some pain in masticating. Tension remained normal without a miotic. Wound healed by first intention.

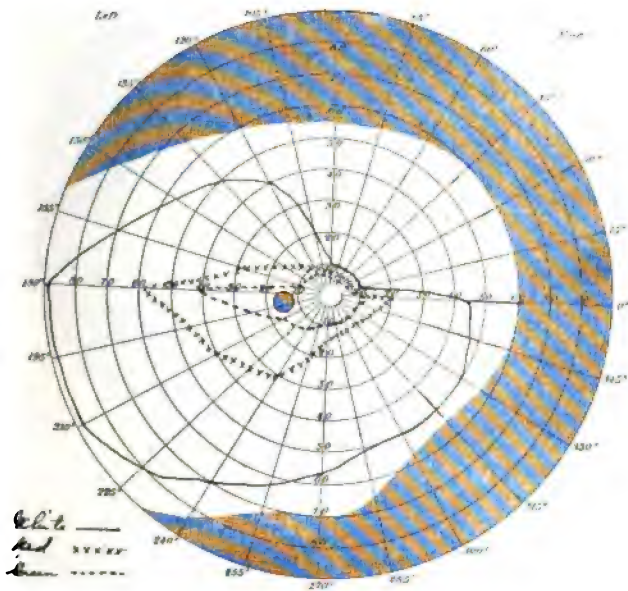


Fig. 20. Case 5. Twelve days after sympathectomy. J. S., aged 76. Simple glaucoma. Dec. 18, 1902. Left eye. V. 20/20-2. Tn. Good illumination. Object 1 cm. sq.

December 18, 1902. Hoarseness has disappeared. Ptosis. General condition good. L. V. \bar{c} glass = 20/20 — 2. Tn.

Field not markedly changed, except that it seemed slightly increased in the upper nasal quadrant for white, and slightly decreased for green in the lower temporal area (Fig. 20).

The patient went to his home in an adjoining state soon after this date, with instructions to use pilocarpine regularly.

January 21, 1903. Reported to me again. Refraction has changed somewhat, for now he sees best with Sph. +

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1.25 \ominus Cyl. + 0.50 ax. 180°, which gives him L. V. = 20/30. Pupil small. Tension slightly plus. Field was taken in a poor light as compared with the others, and shows more contraction, especially for colors, and a notch appears in the upper temporal field (Fig. 21). He still has some pain at corner of left jaw when he eats. Slight ptosis.

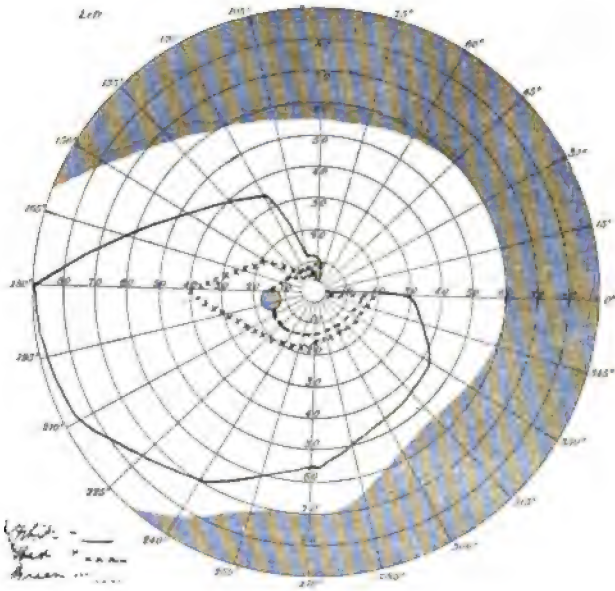


Fig. 21. Case 5. Six weeks after sympathectomy. J. S., aged 76. Simple glaucoma. January 21, 1903. Left eye. V. 20/30. T + (?). Poor illumination. Object 1 cm. sq.

CASE 6. SIMPLE GLAUCOMA, LEFT. ABSOLUTE GLAUCOMA, RIGHT. SYMPATHECTOMA, LEFT (IMPROVEMENT).

Margaret F., aged 78, entered the service of Dr. Beard, in Illinois Eye and Ear Infirmary, Jan. 25, 1903, and was kindly referred to me. Strong, well preserved woman, who has usually had good health, except that since childhood she has had frequent attacks of sick headache which continued up to two years ago, when the sight of her right eye began to fail, followed soon after by failing vision of the left. Early in the course of the disease she noticed halos around a light. On admission:

R. V. = perception of light in temporal field. T+. Anterior chamber of normal depth, pupil slightly dilated, spicules of opacity in the periphery of the lens. Optic disc sharply cupped, with atrophy and glaucomatous halo.

L. V. = 8/200 \bar{c} Sph. + 3.50 slight improvement. T+. Anterior chamber of normal depth, pupil slightly dilated, faint spicules of opacity in periphery of lens; well marked, but rather shallow excavation of optic disc with halo. Retinal veins somewhat engorged. Disc rather pale. No pulsation of arteries or veins. Patient is hyperopic and has been wearing

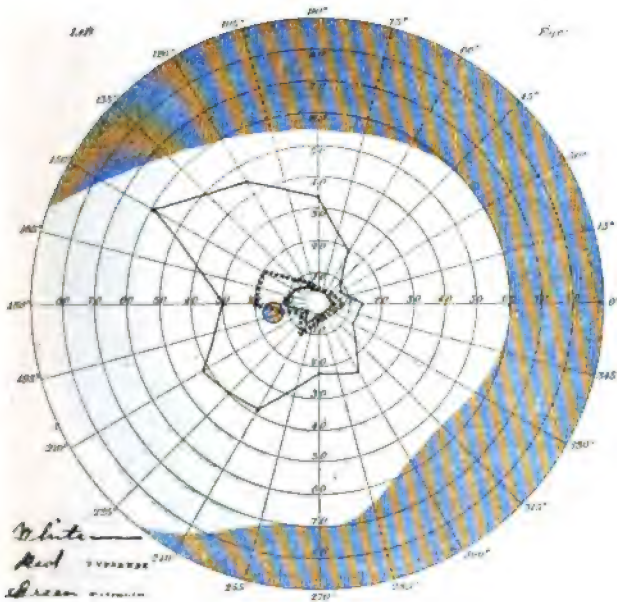


Fig. 22, Case 6. Before sympathectomy. Margaret T., aged 78. Simple glaucoma. January 30, 1903. Left eye. V. 8/200. T+. Object 1 cm. sq.

Sph. + 3.25 for distance. She has marked arterio-sclerosis, the superficial arteries being very hard. Urinalysis shows specific gravity, 1024, albumin and no casts. The visual fields of the left eye (Fig. 22) are markedly contracted, especially the color fields, and the nasal side is almost obliterated. Fields of right eye could not be charted. Under eserine and pilocarpine the tension was reduced to nearly normal and the pupils contracted.

Feb. 14. Left pupil considerably dilated, 5 mm. T +.

Feb. 16, 1903. Excision of left superior cervical sympathetic ganglion by Dr. A. E. Halstead under morphia and chloroform narcosis. The operation was uneventful and immediately after the removal of the ganglion, the left pupil contracted.

Feb, 17, 1903. Tn. Slight ptosis of left, pupil contracted. Has headache and is hoarse.

Feb. 19, 1903. Pupil again somewhat dilated but not so much as before the operation. It was suspected that two

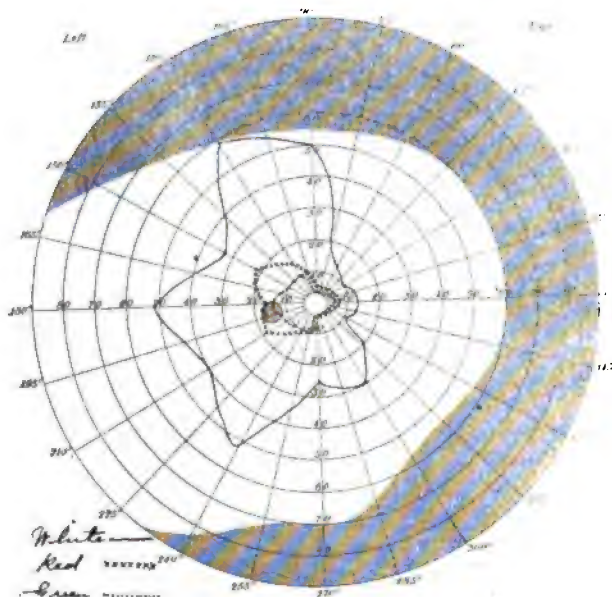


Fig. 23. Case 6. Six weeks after sympathectomy. Margaret T., aged 78. Simple glaucoma. March 30, 1903. Left eye. V. 20/200. Tn. Object 1 cm. sq.

days before the operation some atropine had been put into the eye accidentally by the use of an atropine dropper when the eserine was being instilled and that this accounted for the sudden mydriasis. Immediately after the operation the pupil contracted for 24 hours, then dilated for a few days, and then again contracted and remained so. Headache persists and there is anesthesia of the left auricle.

Feb. 26, 1903. Ptosis of left. Pupil 1/2 mm. smaller than the right. Tn. L. V. = 13/200.

March 10, 1903. L. V. = 13/200 \bar{c} Sph. + 3.50 = 20/200. Tn. Pupil remains smaller than right. Hoarseness and headache have disappeared and sensation has returned to left ear.

March 30, 1903. L. V. = 18/200 \bar{c} Sph. + 3.50 = 20/120. Tn. Right pupil three and a half mm., left pupil three mm. Ptosis persists. Fields improved (Fig. 23).

April, 15, 1903. Left hospital with instructions to use pilocarpine and to return at once if vision begins to fail.

June 1, 1903. Readmitted to hospital L. V. \bar{c} Sph. + 3.50

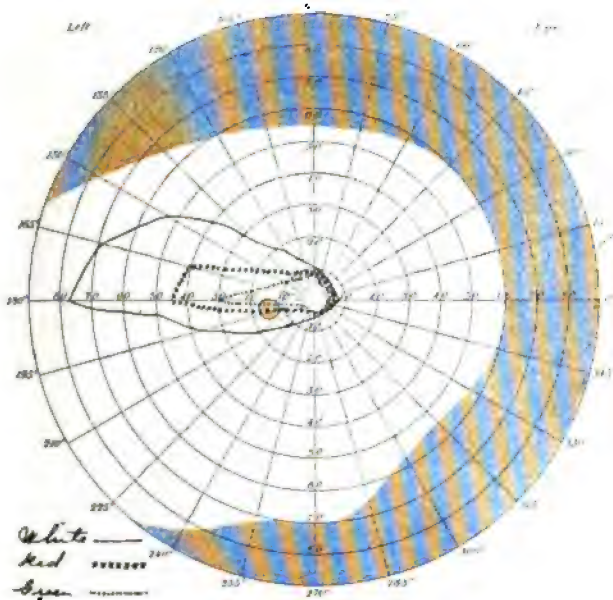


Fig. 24. Case 7. Before sympathectomy. Chas. D., aged 57. Simple glaucoma. February 10, 1903. Left eye. V. = 20/40. T+. Object 1 cm. sq.

= 20/200 +. Tn. Left pupil smaller than right. Fields about the same as in Fig. 23.

A letter from the patient dated December 23, 1903, informs me that the favorable condition of the left eye continues.

CASE 7. SIMPLE GLAUCOMA, LEFT. SIMPLE ABSOLUTE GLAUCOMA, RIGHT. LEFT SYMPATHECTOMY (WITHOUT BENEFIT). LEFT IRIDECTOMY, COMPLICATED WITH INTRAOCULAR HEMORRHAGE. LOSS OF SIGHT.

Chas. F. D., aged 57, was admitted to the Illinois Eye

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and Ear Infirmary, Feb. 10, 1903, where he was assigned to the service of Dr. Chas. H. Beard who kindly transferred him to my service. Patient usually had good health and excellent sight until two years before when he first noticed that the vision of the right eye was foggy at times, and he would see halos around a light. The right vision continued to fail, but he had no pain or inflammation in it. Three months before his admission, the same trouble began in his left eye, so that he could no longer see well to do the fine

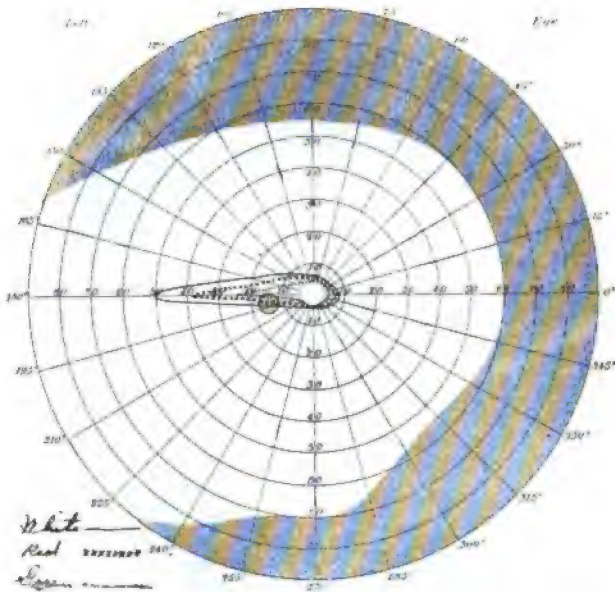


Fig. 25. Case 7. One month after sympathectomy. Chas. D., aged 57. Simple glaucoma. March 13, 1903. Left eye. V. = 20/40. T + 1. Object 1 cm. sq.

work that his occupation, that of bronze sculpture work, required. Three weeks before entrance to the hospital he first noticed halos about a light with the left eye.

He states that he has had occasional attacks of temporary blindness in both eyes, lasting a few minutes. Urine normal. Arterial tension rather high. R. V. = perception of light. T +. No fields. Media somewhat hazy. Optic disc deeply cupped. L. V. = 20/100 c Sph. + 1.50 = 20/40. Pupil responsive to light and moderately dilated. Anterior cham

ber normal in depth. T +. Glaucomatous excavation of optic disc. Fields markedly contracted, only a small temporal field remaining (Fig. 24).

Feb. 16, 1903. Removal of left superior cervical sympathetic ganglion under morphia and chloroform narcosis by Dr. A. E. Halstead. The operation was somewhat difficult on account of the patient's thick neck. The ganglion was very

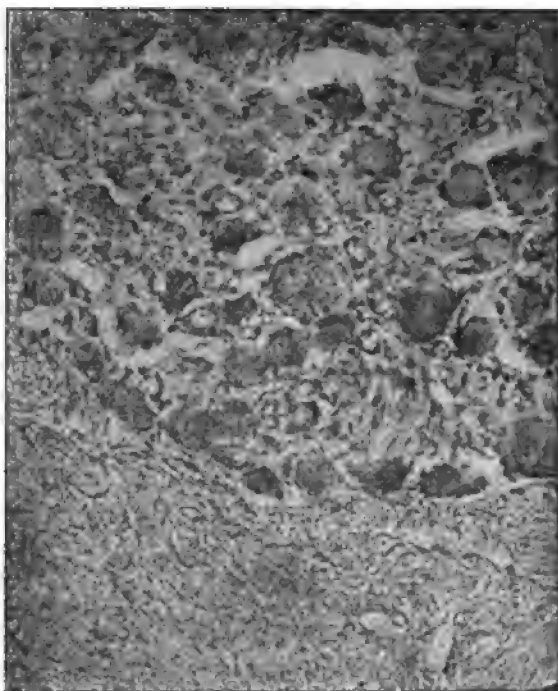


Fig. 26. Section of ganglion from case 4. Pigmented, irregular cells with excentric nuclei.

small, but was removed with about 3 c. m. of the nerve. Spinal accessory nerve was cut and was afterward united with cat-gut suture.

Feb. 17, 1903. Patient recovered well from the operation. Pupil is contracted, ptosis marked. Partial anesthesia of left side of face and neck. T + as before.

Feb. 26, 1903. Left upper lid droops about 2 mm. more

than right. Right pupil 4 mm. Left pupil 2 1-2 mm. L. V. \bar{c} Sph. + 1.50 = 20/40. T +.

Pain in left side of face and jaw, slight hoarseness and some loss of power in left shoulder. The hyperesthesia of the left side of the face about the jaw and ear was intense, so that he could not bear the slightest touch. He fainted on being shaved, because of the severe pain. Eserine was used regularly.

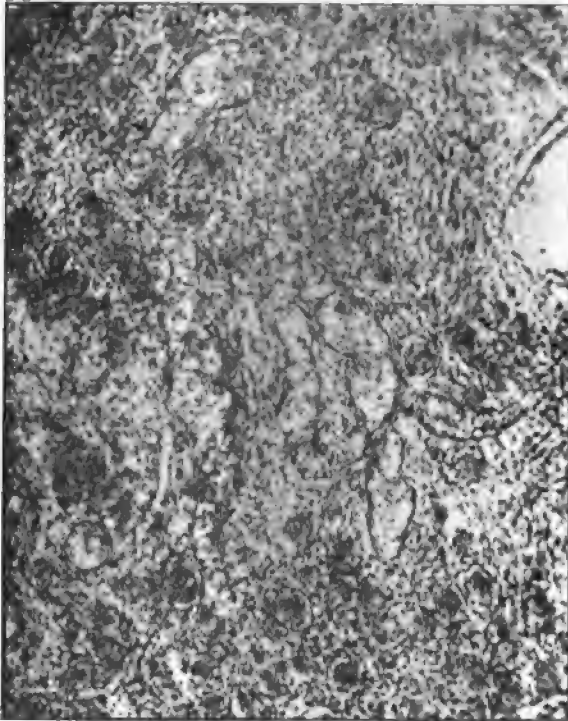


Fig. 27. Section of ganglion from case 5, showing marked vascularity.

March 13, 1903. L. V. \bar{c} Sph. + 1.50 = 20/40. T + 1. Ptosis and miosis persist. Hyperesthesia of the face gradually getting less. Fields much contracted, being reduced to a narrow slit (Fig. 25).

March 17, 1903. Anterior sclerotomy. Slight reduction of tension.

March 21, 1903. Tension again as high as before. Under cocaine and holocain anesthesia an iridectomy was done upward. Immediately after completing the corneal incision the wound gaped widely and after a portion of the iris had been excised, vitreous began to present in the wound and the patient complained of intolerable pain. After cutting off the portion of extruding vitreous, the lens was forced into the

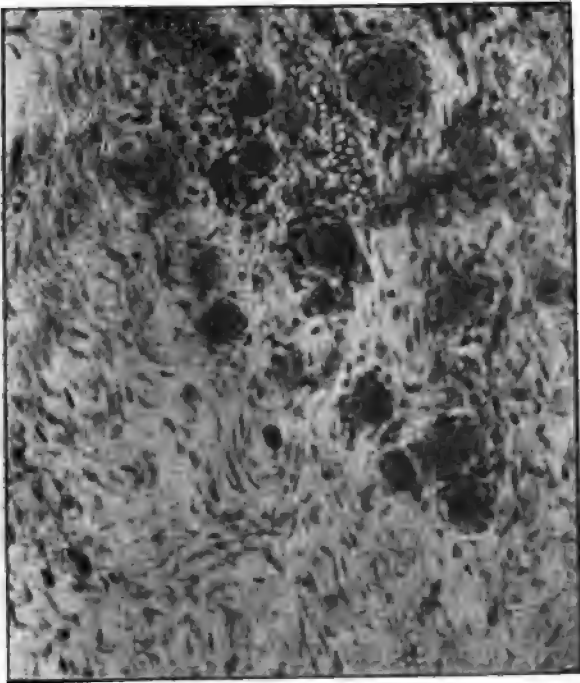


Fig. 28. Section of ganglion from case 6. showing pigmentation of the cells and apparent increase of connective tissue.

wound and had to be removed. Then followed more vitreous and a copious hemorrhage, the patient all the time experiencing great suffering. The bleeding was finally checked and the eye bandaged. The patient was given an opiate and put to bed, and immediately had a severe chill.

March 22, 1903. Patient was fairly well and not suffering much. In the gaping corneal wound was seen a clot of blood and a tissue resembling iris or chorioid. There was

comparatively little reaction after the operation. The wound became smooth by the separation of the protruding mass and the blood in the anterior chamber was absorbed. At the present time, April 20, 1903, the wound has healed. Eye sensitive to touch. T — 2. V. = O. Sensitiveness of the side of the face has disappeared, and the patient has completely regained the power of the arm and shoulder.

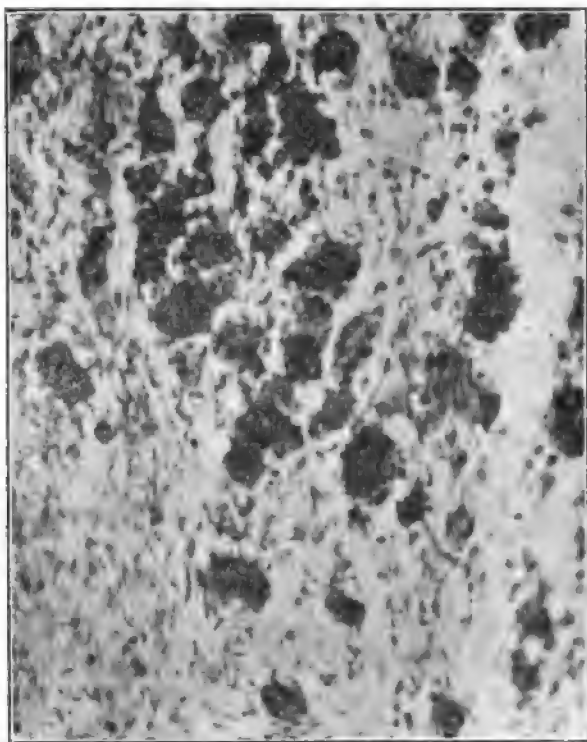


Fig. 29. Section from ganglion of case 7, showing irregularly shaped, deeply pigmented cells.

The excised ganglia in the last four cases were prepared by Dr. E. V. L. Brown, the pathologist of the Illinois Eye and Ear Infirmary, and were examined by him and also by Dr. Sydney Kuh, Prof. of Diseases of the Nervous System at the Post Graduate Medical School. To these gentlemen I am indebted for the notes on the histologic appearances of

the specimens. All of the specimens were hardened in 5 per cent. formalin and corrosive acetic solution and stained with toluidin blue and with hemotoxylin and eosin.

In all of the specimens there was increased pigmentation of the ganglion cells. In cases 4 and 5 mast cells were seen. In cases 4, 5 and 7 it was noted that the cells were not round, but of irregular shapes (Figs. 26, 27, 29).

In one case, No. 6, cells slightly vacuolated were observed. In two cases, 4 and 5, it was noted that the cells showed excentric nuclei, and in the same cases marked vascularity was present (Figs. 26 and 27). Some of these features, especially the pigmentation and the vascularity are shown in the accompanying photo-micrographs. None of the specimens shows conspicuous increase of connective tissue, as has been noted by some other observers, although Fig. 28 at the place where the picture was taken apparently shows it. The histologic examination lacks completeness, as unfortunately there was not available for control study, normal ganglia from individuals of the same age as the patients. As the pigment in the ganglion cell is normally increased in advancing age, it cannot be said that these present an abnormality.

REPORT OF 61 ADDITIONAL OPERATIONS OF EXCISION OF SUPERIOR CERVICAL SYMPATHETIC GANGLION FOR GLAUCOMA.

JAMES MOORES BALL. THREE CASES OF GLAUCOMA.
FOUR OPERATIONS.

No. 8. Glaucoma absolutum, right. Right sympathectomy. Improvement.

Man aged 36. R. V. = P. 1. L. V. = 20/70. Pain in right eye for two months. Chronic irritative glaucoma. Optic disc cupped. T + 3.

Operation.—May 15, 1899. Excision rt. sup. cerv. symph. ganglion. Tension fell to + 1, ptosis. Vision increased to fingers at 3 ft. Report April 4, 1903, pain was relieved for one year. T + 3.

Nos. 9 and 10. Simple glaucoma of both. Bilateral sympathectomy, slight improvement.

Woman aged 43. R. V. = O. T + 3. L. V. = P. 1. T + 3.

Duration, two years. No pain. Optic disc cupped. No fields taken.

Operation.—Left sympathectomy, June 15, 1899. Lacrimation. Ocular congestion and contracted pupil of same followed. Ptosis. Eighth day counted fingers at 4 ft. June 30, 15th day, fingers at 5 ft. in temporal field. Tn.

Operation.—July 16, 1899. Right sympathectomy, four days later R. V. = hand movements. L. V. = F. 7 ft. R. T + 1. L. T + 1.

Report, April 4, 1903. Patient became blind in Nov., 1898, from an acute attack of glaucoma, left.

No. 11. Hemorrhagic glaucoma. Sympathetic ganglion was removed in a man 26 years old for relief of pain in hemorrhagic glaucoma. Relief of pain was immediate and lasted 10 months. One year after operation the man had his eye removed. No further details were given.

MELVILLE BLACK. 1 CASE SUB-ACUTE GLAUCOMA.

No. 12. Sympathectomy. Cure. First reported Oct., 1901, Ophth. Rec. M. aged 35. Colored. Left eye. Duration 2 mos. R. V. = 5/5.

L. V. = F. 1 ft. after eserine = 5/20. Left cornea steamy and no view of fundus obtainable. T + 2, pupil dilated. Fields normal after eserine.

Operation.—Dec. 24, 1900. Excision of left superior and middle cervical sympathetic ganglion, followed by immediate return to normal vision, normal tension, contracted pupil 1 1/2 mm. and normal fields. Ptosis, congestion of conjunctiva, increased lacrimation were noted.

Report, April 7, 1903. L. V. = 5/6 c Sph. + 1.00. R. pupil 4 mm. L. pupil 3 mm. Tn. Fields normal. No symptoms of return of glaucoma or any other symptoms of inconvenience. Ptosis scarcely noticeable and the conjunctival injection had disappeared. Slightly myopic before operation. Now hyperopic 1 D. No complications or accidents attending operation.

CALLAN. 1 CASE. BUPHTHALMUS. SECONDARY GLAUCOMA. SYMPATHECTOMY. NO IMPROVEMENT.

No. 13. M., aged 25 years. Highly myopic. R. V. c Sph.

— 20 Cyl. — 1.00 ax. $105^{\circ} = 20/200$. L. V. \bar{c} Sph. — 22.00 = 20/200. History of gradually failing sight. Nystagmus. Tension plus 1 in each. Marked excavation of optic discs.

Operation.—May 26, 1902. Excision of rt. sup. cerv. sympathetic ganglion. After op. R. E. T — 1. L. E. T + 1. Both pupils contracted. No ptosis, congestion of face or other phenomena. No accident or complications.

Report March 27, 1903. (by letter). "Tension at present time + 1. The only improvement is that the operated eye is not so prominent and possibly the nystagmus not so marked. Tension, pupil and vision remain the same as before the operation. The cosmetic effect is an improvement."

D. H. COOVER. 1 CASE. SIMPLE GLAUCOMA. BOTH. RIGHT SYMPATHECTOMY—TEMPORARY IMPROVEMENT.*

No. 14. M., aged 65 years. Failing vision for one year. R. V. = P. 1. in temporal field. T + 3. Optic disc cupped. L. V. = 20/200. T + 2. Disc cupped. Fields contracted. Miotics useless.

Operation.—March 31, 1900. Excision of right sup. cervical sympathetic ganglion. A few days later tension somewhat lower. R. V. = 5 ft. Four months later R. V. again reduced to P. 1. T + 3. L. V. had fallen from 20/200 to 5/200.

COLEMAN W. CUTLER. 1 CASE RT. CHRONIC IRRITATIVE GLAUCOMA. LEFT ABSOLUTE GLAUCOMA. RIGHT SYMPATHECTOMY, GREAT IMPROVEMENT. CASE REPORTED SEPT., 1902. PREVIOUS IRIDECTOMY.

No. 15. M., aged 56. Duration of disease 8 yrs. History of attacks of pain, cloudy vision, halos, and failing sight. Sclerotomy in 1897. Iridectomy in right in 1898.

June 2, 1901. R. V. = F. 3 ft. T + 1/2 to 1. L. V. = O. T + 2.

After eserine R. V. = 20/200 +. Pain in both eyes. Fields contracted.

*Philadelphia Med. Journal, March 16, 1900.

50 RESECTION OF THE CERVICAL SYMPATHETIC GANGLIA.

Operation.—June 10, 1901. Excision of rt. sup. cerv. sympath. ganglion,

One day after T — $1/2$. V. = 20/30. Slight ptosis, some dysphagia, pain in right side of head and face and impaired phonation. Improvement continued. Fields increased. May, 1902, one year after, R. V. = 20/30. Fields increased. No signs of nerve lesions except some paraesthesia of side of face and neck and occasional sharp pain in temporo-maxillary articulation.

Last report, March 27, 1903, letter. Cutler has not seen patient since Aug. 25, 1902, but thinks if results had not been favorable he would have called.

W. A. FISHER. 1 CASE. CHRONIC GLAUCOMA. RIGHT SYMPATHECTOMY. NO IMPROVEMENT.

No. 16. F., aged 62. Both eyes affected for two years. R. V. = 12/200. Tn. Pupil somewhat dilated. Excavation of optic disc. Fields contracted.

Operation.—June 8, 1899. Excision of rt. sup. cerv. sympath. ganglion. No accidents or complications. Operation negative as to effect on lid, conjunctiva, tears, respiratory passage and skin of face. Negative as to effect on vision. Last report April 4, 1900, ten months after operation. R. V. = 4/200. L. V. = O. No effect on pupil or vision. Fields unchanged.

HENRY GRADLE. 1 CASE. CHRONIC GLAUCOMA. PREVIOUS IRIDECTOMY. SYMPATHECTOMY (STATIONARY).

No. 17. F., aged 33 years. Both eyes affected, left for a period of three years. Both optic discs cupped. R. V. = 20/40 +. Fields normal on temporal side contracted above 10° down 10° inward 15° . Pupil moderately dilated on account of large coloboma. T +. Two iridectomies had been done, one 30 months, the other 15 months before, both having apparently delayed the course of the disease but not stopped it entirely. L. V. = O. No report of this eye.

Operation.—March 13, 1900. Excision of sup. cerv. sympath. ganglion of rt. side. No accidents or complications. After operation T — and is normal after two and a half years. Pupil distinctly contracted for 2 or 3 months; and

two and a half years after the operation, is as it was before. Central vision unchanged 20/40 +. Doubtful enlargement of fields at first, but practically stationary during two and a half years. After operation there was ptosis, slight congestion of conjunctiva and skin of face. These all receded in a few months.

E. GRUENING. 2 CASES. 1 CHRONIC GLAUCOMA (BOTH). 1 OPTIC ATROPHY (BOTH). CASE 1 PREVIOUS IRIDECTOMY. SYMPATHECTOMY, SLIGHT IMPROVEMENT.

No. 18. M., aged 60 years. Both eyes affected with chronic glaucoma for three years.

R. V. = F. in upper temporal quadrant at 2 feet T + 1. Field in upper temporal quadrant. Disc deeply cupped. Coloboma from previous iridectomy. L. V. = O. T + 1. Disc deeply cupped.

Operation.—In 1901. Removal of rt. sup. cerv. sympath. ganglion. There was no change in pupil. Tn. and remained so one year after operation. Patient retained same central and peripheral vision at time of last report, one year after operation. Ptosis. Paralysis of recurrent laryngeal causing dysphonia that lasted nine months and then disappeared.

LEFT SYMPATHECTOMY. NO IMPROVEMENT.

No. 19. M., aged 35. Atrophy of both optic discs of 2 yrs. standing. Both optic discs white. R. V. = O. L. V. = 20/30. Fields of left contracted to 10° in every direction. Tension normal in each.

Operation.—1902, removal of left sup. cerv. sympath. ganglion. As a result of the operation there was some sinking of the eyeball, and also paralysis of left recurrent laryngeal nerve. Dysphonia lasted about six months, although the paralysis of the recurrent laryngeal persisted. Tension remained normal. Left vision was completely lost two months after the operation.

A. B. HALE. 1 CASE. THREATENED GLAUCOMA, LEFT. ABSOLUTE GLAUCOMA, RIGHT. LEFT SYMPATHECTOMY.

No. 20.—F., aged 48. Total loss of vision of right eye after

two iridectomies had been done.

R. V. = O. T +. Deep excavation of optic disc.

L. V. \bar{c} Sph. + 1.00 = 6/5. T + ?. Optic disc normal. Pupil normal. Fields contracted and wavering.

Operation.—December 15, 1902. Excision of left sup. cerv. sympath. ganglion. After operation L. V. \bar{c} Sph. + 1.00 = 6/5. T —. Pupil small. No effect on lid, conjunctiva, lacrimation or skin. Loss of sensation in lower half of ear. Last report, March 1, 1903. Condition as above. Fields normal. Tn. Operation was done to ward off an impending attack of glaucoma. This operation was preferred, because the right eye had been lost after two iridectomies.

J. G. HUIZINGA. 2 CASES. 1. CHRONIC SIMPLE GLAUCOMA, BOTH EYES. DOUBLE SYMPATHECTOMY. NO IMPROVEMENT. 2. CHRONIC INFLAMMATORY GLAUCOMA, BOTH EYES. LEFT SYMPATHECTOMY. NO IMPROVEMENT.

Nos. 21 and 22.—M., aged 57. Both eyes affected for 17 years.

R. V. = P. 1. T + 1. Fields greatly contracted.

L. V. = 6/20. Tn. Field for white contracted, being almost obliterated on the nasal side, 65° temporal side, 10° above, 40° below. Color fields about 10°.

Operation.—October 14, 1898. Excision of both sup. cerv. sympath. ganglia. Immediate effects: conjunctiva injected, slight increase of lacrimation. Inspiration difficult from slight edema of glottis. Patient quite hoarse for several weeks, but fully recovered. No material change in vision of either eye. Tn. and remaining so one year afterward. Pupils that were about 4 mm. before operation contracted slightly afterward, and then returned to the usual size. One year afterward there was no change.

No. 23.—M., aged 36. Chronic inflammatory glaucoma of both eyes of several years duration with recurring attacks.

R. V. = F. 3 ft. T + 3. Pupil widely dilated, because of atropine used by patient's physician. Fields could not be taken. Optic discs could not be clearly seen.

L. V. = F. 3 ft. T + 3. Pupil same as right. Fields could not be taken. Disc could not be seen.

Operation.—January, 1902. Excision of left sup. cerv. ganglion and at the same time iridectomy on each eye.

Result: Vision became worse and worse, until there was complete blindness. Considerable lacrimation for several weeks after operation. One year after R. T + 1. L. T. + 2.

No accidents or complications from the sympathectomy.

ARNOLD KNAPP. 1 CASE. CHRONIC GLAUCOMA WITH ATROPHY
BOTH EYES. BILATERAL SYMPATHECTOMY AFTER RT.
IRIDECTOMY.

Nos. 24 and 25.—M., age 20. No history as to duration. R. V. = 16/200 after successful iridectomy. Optic disc deeply cupped and atrophic.

L. V. = 12/200. T + 2. Disc cupped and atrophic. Fields contracted to 10° of center.

Operation.—June 10, 1902. Excision of both sup. cerv. sympath. ganglia. Slight drooping of both upper lids followed. Hoarseness that lasted several weeks. Vision improved to 20/100 each. R. Tn. L. T + ?.

Fields did not change. Last report, March 18, 1903, 10 months after operation. R. V. = 20/200. Tn. L. V. = 12/200. T +. Fields same as before.

HARRY LAMOTTE. 4 CASES. ACUTE INFLAM. GLAUCOMA,
BOTH EYES. IRIDECTOMY, RIGHT, RECOVERY.
SYMPATHECTOMY, LEFT, RECOVERY.*

No. 26.—M., aged 27. Duration of disease 3 months. Acute attacks of glaucoma relieved by eserine. Cupping of discs.

R. V. = F. 6 ft. Iridectomy. Vision improved in 6 weeks to 20/30.

L. V. = P. l. T + 1. Field not taken.

Operation.—March 25, 1901. Excision of left sup. cerv. sympath. ganglion and connections. Ptosis, increased lacrimation and injection of conjunctiva followed. Pupil before operation was dilated. After operation it contracted. T. became normal.

Last Report, July, 10, 1902.

R. V. = 20/40. Tn. Field somewhat contracted. Pupil contracted.

L. V. = 20/20. Tn. Field normal. Pupil normal.

*Denver Med. Times, March, 1903.

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CHRONIC INFLAM. GLAUCOMA (BOTH). DOUBLE SYMPATHECTOMY. RECOVERY.

Nos. 27 and 28.—F., aged 38. Duration of two and a half years, during which time she had occasional attacks of severe pain, increased tension, impaired vision. In the intervals between attacks, vision approached nearly to normal. R. V. = 20/30. L. V. = 20/40. Slight cupping of optic discs. Visual fields were not taken.

Operation.—May, 1, 1901. Excision of left sup. cerv. sympath. ganglion. Pupil contracted afterward and has remained so. Slight ptosis occurred, but no other manifestation except anesthesia of side of face and neck which disappeared after several months. L. V. before operation 20/200. Vision returned to 20/20. Tn.

Operation.—July 9, 1901. Excision of rt. sup. cerv. sympath. ganglion. For about one week before R. V. had been much reduced and there was considerable pain. R. V. = P. l. T + 1. Optic disc cupped. After operation vision soon returned to normal. Tn. Slight ptosis, increased lacrimation. pupil contracted, pain and discomfort disappeared.

Last report. September 1, 1902.

R. V. = 20/20. Tn. Some contraction of fields.

L. V. = 20/20 Tn Contraction of fields to 40°.

SIMPLE GLAUCOMA RIGHT. RIGHT SYMPATHECTOMY. IMPROVEMENT.

No. 29.—M., aged 43, duration of disease 6 months. Had been treated by some quack physician who had been giving atropine for iritis.

L. V. = 20/20. Eye normal.

R. V. = F. 3 ft. T + 2. Pupil dilated. Visual fields could not be taken.

Operation.—January 24, 1902. Excision of rt. sup. cerv. sympath. ganglion. No unfavorable sign. No ptosis; conjunctiva injected, lacrimation increased. T remained + 2. Pupil contracted. Central vision improved.

Last report March 25, 1903, fourteen months after. R. V. = 20/70. T + 1. Pupil contracted. Fields concentrically contracted. Degree not given.

SIMPLE GLAUCOMA RIGHT. RIGHT SYMPATHECTOMY. DEATH FROM SEPSIS.

No. 30.—M., aged 40, large healthy soldier. History of impairment of vision of right eye for one year.

R. V. = 20/30. T + 1. Pupil dilated, concentric contraction of fields, slight excavation of right disc.

L.V. = 20/20. Tn. Pupil normal, slight contraction of fields.

Operation.—February 17, 1903. Excision of rt. sup. cerv. sympath. ganglion. Patient took ether badly and chloroform was substituted. Just before the nerve was excised, he vomited suddenly and expulsively and some of the vomit fell into the wound. This was cleansed with the utmost care but in spite of all precaution infection extended to the deep structures of the neck and he died of septic pneumonia on the 15th day after the operation. After operation, T + 1. Pupil contracted. Slight aphonia, increased lacrimation and injection of conjunctiva. Fields were not taken.

JOSEPH MULLEN. 1 CASE. CHRONIC INFLAM. GLAUCOMA (BOTH). PREVIOUS IRIDECTOMY. RT. SYMPATHECTOMY. TEMPORARY IMPROVEMENT.*

No. 31.—F., aged 48. History of bilateral iridectomy 23 years previously for acute glaucoma. Gradual decrease in vision since that time with occasional acute pains in eyes and head. Severe attack at the time she was first seen by operator.

R. V. = F. 5 ft. T + 2.

L. V. = 5/200. T + 2.

Both optic discs cupped. Right field irregularly contracted to 20 degrees above, 30 degrees temporal, 20° nasal, 15° below. Left field concentrically contracted to about 30°.

Operation.—March 18, 1900. Excision of right sup. cerv. sympath. ganglion. Increased lacrimation. Congestion of conjunctiva and face. Coloboma prevented accurate statement as to pupils. Tension in both eyes normal. Pain was relieved. Fields in both eyes were increased by as much as 10 to 20 degrees all around, the improvement being more marked in the right. Central vision improved. Degree not

*Amer. Med., June, 1901.

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stated. Three months after operation improvement was lost and increased tension and pain returned.

Nine months later, R. V. = 15/200. L. V. = 20/200.

Charts showed decrease of fields nearly to same degree as before operation, with left field very irregular.

Last report, April 8, 1903.

R. V. = 20/100. Field as before operation.

L. V. = 20/70. Field larger than it was December 18, 1900.

W. B. MARPLE. 1 CASE. CHRONIC GLAUCOMA. SYMPATHECTOMY. NO IMPROVEMENT.

No. 32.—Patient who had ribbon shaped keratitis. V. = 10-15/200. T + 1. Pupil partly dilated.

Operation.—August, 1902. Excision of sup. cerv. sympath. ganglion. After operation T. became normal and pupil diminished in size. Vision unchanged. Patient has been under observation six months.

H. R. PRICE. 2 CASES. SIMPLE CHRONIC GLAUCOMA IN BOTH EYES WITH HEMORRHAGIC RETINITIS AND CHRONIC NEPHRITIS RIGHT. SYMPATHECTOMY. IMPROVEMENT.

No. 33.—M., aged 70. Duration of disease one year.

R. V. = P. 1. improved under eserine to 20/200. Pupil dilated. Tension variable from Tn. to T + 3. Fields contracted especially on nasal side. Numerous hemorrhages in the macular region. Deep excavation of disc.

L. V. = 20/100. Tn. Pupil normal. Hemorrhages as in the right, typical glaucoma cupping. Before operation R. V. = P. 1.

Operation.—May, 26, 1902. Excision of rt. sup. cerv. sympath. ganglion. Pupil contracted, slight hyperemia of conjunctiva and skin of face same side, increased lacrimation slight, and slight ptosis. Seven days after operation, R. V. = 20/200 c Sph.—1 D. = 20/100. Field considerably enlarged.

Last report, October 3, 1902. Five months after operation, R. V. = 20/100 Tn. Pupil contracted. Patient not seen later. Result considered favorable in view of the hemorrhagic condition.

SIMPLE GLAUCOMA. RIGHT SYMPATHECTOMY. HISTORY INCOMPLETE. PREVIOUS IRIDECTOMY, MARCH, 1902.

No. 34.—M. aged 55. Duration of disease 1 year. Had iridectomy done March, 1902.

R. V. = 20/40 declining to 20/70 with rapid loss of field.

Persistent plus tension. Deep glaucoma cupping:

Operation.—August 1, 1902. Excision of rt. sup. cerv. sympath. ganglion. Tension became minus and ptosis, hyperemia of conjunctiva and face were noticed as well as slightly increased lacrimation. No other phenomena and no other accidents. Patient left hospital 15 days after operation and subsequent history was not obtained.

R. C. REESE. 1 CASE. CHRONIC SIMPLE GLAUCOMA, BOTH EYES. IRIDECTOMY 5 YEARS BEFORE. RIGHT SYMPATHECTOMY, IMPROVEMENT.

No. 35.—F., aged 58. Duration of disease 6 years.

R. V. = F. 10 feet, not improved with lens. T +. Pupil shows coloboma. Fields contracted considerably at nasal side. Deep glaucoma cupping of disc.

L. V. = O. Pupil and disc as in right. Double iridectomy had been done 5 years before, and ever since that time she had used eserine occasionally to keep the tension down.

Operation.—May, 28, 1902. Excision of rt. sup. cerv. sympath. ganglion. T—. No increase of central vision. Slight ptosis, and neuralgic pains in the left side of face and neck that lasted for two months.

Last report, April 2, 1903, nearly one year after operation. R. V. = F. 10 feet. Fields unchanged. T—. Does not have to use a miotic.

E. C. RENAUD. 6 CASES (5 BILATERAL). CHRONIC IRRITATIVE GLAUCOMA, RIGHT. RIGHT SYMPATHECTOMY. IMPROVEMENT.

No. 36—F. aged 48. Duration 10 months. R. V. = 20/200. T + 3. Pupil dilated and immovable. Media hazy, disc cupped. Fields not taken.

L. V. = 20/20. Tn. Pupil and fundus normal. Attacks of pain in right eye.

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Operation.—Nov. 29, 1899. Excision of rt. sup. cerv. sympath. ganglion. Ptosis of right lasted 18 days. Hyperemia of conjunctiva and lacrimation lasted 3 days. No accidents or complications. R. V. improved to 20/50 and pupil contracted. Tn. later became slightly plus. Pain disappeared within 24 hours.

Last report April, 1903. R. V. = 20/50. L. V. = 20/20. No ptosis. Good condition continues.

CHRONIC SIMPLE GLAUCOMA, BOTH. BILATERAL SYMPATHECTOMY. SLIGHT IMPROVEMENT,

Nos. 37 and 38.—M., aged 32. Double simple glaucoma. Duration 18 months.

R. V. = quantitative.

L. V. = large objects at 6 feet. In both eyes T + 2.

Pupils dilated, discs markedly cupped. Fields not taken.

Operation.—March 11, 1901. Bilateral excision of sup. cerv. ganglia. Ptosis lasting two weeks. Hyperemia of conjunctiva and some lacrimation for several days. Pupils contracted. T + 1. Vision improved to 6/100 in each.

Last report two years after operation shows that improvement has been retained, although tension is still plus.

CHRONIC SIMPLE GLAUCOMA, LEFT. BILATERAL SYMPATHECTOMY. SLIGHT IMPROVEMENT.

Nos. 39 and 40.—F., aged 40. Simple glaucoma of left eye of 7 months duration.

R. V. = 20/20. Tn. Normal in every way.

L. V. = F. 3 feet. T + 3. Pupil dilated and fixed. Disc markedly cupped. Fields not taken.

Operation.—Sept. 9, 1901. Bilateral excision of sup. cerv. sympath. ganglia. Bilateral ptosis for 16 days. Hyperemia of conjunctiva and increased lacrimation for 3 days. Hysterical manifestations. Tn. Pupils contracted and L. V. = F. 14 feet. No fields.

Last report, April, 1903. Same condition.

CHRONIC IRRITATIVE GLAUCOMA, RIGHT. BILATERAL SYMPATHECTOMY. IMPROVEMENT.

Nos. 41 and 42.—M., aged 39. Duration of disease in right eye 15 months. Attacks of pain at times.

R. V. = P. 1. T + 2. Pupil dilated, media hazy, disc sharply cupped.

L. V. = 20/20. Tn. Media and fundus normal. Eye normal in every way. No fields were taken.

Operation.—Feb. 12, 1902. Bilateral excision of sup. cerv. sympath. ganglia. Bilateral ptosis for 2 weeks. Some injection of conjunctiva and increased lacrimation for several days. Pain relieved.

R. V. = F. 12 feet. Tn. Pupil contracted.

April, 1902. Last report. Same improved condition.

ACUTE GLAUCOMA, RIGHT. BILATERAL SYMPATHECTOMY. IMPROVEMENT.

Nos. 43 and 44.—M., aged 57. History of acute glaucoma in right eye for 3 weeks. Severe pain.

R. V. = 20/100. T + 3. Pupil dilated and fixed. Very slight cupping of disc.

L. V. = 20/20. Eye in every way normal. No fields taken.

Operation.—June 22, 1902. Bilateral excision of sup. cerv. sympath. ganglia. Pain in eye disappeared. Ptosis, bilateral, for 13 days, conjunctival hyperemia and lacrimation. Pupil contracted. R. V. = 20/40.

In April, 1903, at time of last report, no return of the trouble.

CHRONIC IRRITATIVE GLAUCOMA, RIGHT. BILATERAL SYMPATHECTOMY. SLIGHT IMPROVEMENT.

Nos. 45 and 46.—M., aged 46. Duration 11 months. History of attacks of pain in right eye.

R. V. = 20/200. T + 2. Pupil dilated. Disc cupped.

L. V. = 20/20. Eye normal in every way. No fields taken.

Operation.—Nov. 16, 1902. Bilateral excision of sup. cerv. sympath. ganglia, Ptosis for 12 days, pronounced hyperemia of conjunctiva and moderate increase of lacrimation. Pupils contracted and tension in right eye reduced. R. V. = 20/100. L. V. = 20/20.

Favorable result continues at time of last report. April, 1903.

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No recurrence in any of these cases up to date of report, April, 1903. In the irritative cases, the pain was relieved in every instance. No difference was noted in the anterior chamber in any case. In the last four cases, the ganglion was torn from its attachment with a strong forceps instead of being cut.

G. E. DE SCHWEINITZ. 1 CASE. CHRONIC CONGESTIVE GLAUCOMA, BOTH. BILATERAL SYMPATHECTOMY. UNCERTAIN RESULTS.

Nos. 47 and 48.—M. aged 23. Duration seven months.

R. V. = shadows on temporal side. T + 2. Pupil dilated 5 to 6 mm. Light field on temporal side only.

L. V. = shadows imperfectly. T + 2. Pupil dilated 8 mm. Fields contracted so that there was only light perception on temporal side. Green, atrophic, completely cupped discs on each side with typical halo.

Operation.—Dec. 14, 1901. Excision of rt. sup. cerv. ganglion and a considerable piece of the nerve. Slight ptosis followed and congestion of conjunctiva. T slightly diminished. Pupil contracted 3 mm., but this lasted only three days.

R. V. = uncertain counting of fingers in temporal field.

Operation.—Jan. 31, 1902. Excision of left ganglion. No improvement in vision. No change in tension, pupil or field. After first operation decided dysphagia lasting 48 hours. Patient remained free from congestive attacks of glaucoma for two months. Then they returned.

JOHN R. SHANNON. 1 CASE. CHRONIC SIMPLE GLAUCOMA, BOTH. LEFT SYMPATHECTOMY. NO IMPROVEMENT.

No. 49.—F., aged 32. Disease existed for 10 years in both eyes.

R. V. = 15/200. T—?. Pupil large and irregular. Anterior chamber deep. No peripheral vision except in lower temporal quadrant.

L. V. = hand movements centrally; fingers at 3 feet excentrically. T + 1. Coloboma from iridectomy upward. Both discs slightly cupped.

Operation.—June 18, 1902. Excision of left sup. cerv.

sympath. ganglion. No change in pupil and tension remained increased as before. Slight ptosis.

Fields remained the same April 14, 1903.

J. H. SHORTER. 1 CASE.* SECONDARY GLAUCOMA AFTER SYMPATHETIC INFLAMMATION. LEFT SYMPATHECTOMY.
SLIGHT IMPROVEMENT.

No. 50.—M., aged 20, lost right eye from trauma. Glaucoma in left eye for six years following sympathetic ophthalmia.

L. V. = F. 3 ft. T + 2. Pupil fixed from posterior synechiae. Disc not visible on account of central cataract. Large defect on nasal side of field.

Operation.—1901. Excision of left sup. cerv. sympath. ganglion. After operation profuse lachrimation, and mucous discharge from left nostril. Conjunctiva and skin of face were injected. Left ptosis. L. V. = F. 6 feet. Tn. one month after operation.

Final examination showed less contraction of visual fields. Anesthesia of left auricle. Transitory hoarseness.

ELMER G. STARR. 1 CASE. SIMPLE GLAUCOMA, BOTH. POSTERIOR SCLEROTOMY. BILATERAL SYMPATHECTOMY.
MARKED IMPROVEMENT.

Nos. 51 and 52.—F., aged 63. Duration 1 year. Disease had been held in check for 9 months with eserine, until by mistake patient used atropine which caused reduction of vision to fingers at 4 feet and increase of tension to plus 3.

Sclerotomy of right eye increased vision to F. 18 ft. Marked cupping of both discs with some atrophy. Immediately before sympathectomy:

R. V. = F. 18 ft. T + 2. Pupil moderately dilated.

L. V. = F. 4 ft. Tn. Pupil moderately dilated.

Fields of both eyes typically contracted.

Operation.—Oct. 16, 1902. Bilateral excision of sup. cerv. symp. ganglia. Result on lid, conjunctiva, etc., nil.

R. V. = 20/50. T + 1. Pupil normal.

L. V. = 20/50. Tn. Pupil normal.

Last report April 15, 1903, states that above condition

*American News, April 6, 1901.

persists but that visual fields have decreased somewhat. For 2 or 3 weeks after the operation inability to raise the arms. This disappeared. Painful sensation at times in the neck.

GEO. F. SUKER. 4 CASES. 5 OPERATIONS.* SIMPLE CHRONIC GLAUCOMA, BOTH. ABSOLUTE GLAUCOMA, RIGHT. RIGHT SYMPATHECTOMY. NO IMPROVEMENT.

No. 53.—M., aged 70. Duration about 2 years.

R. V. = O. T + 3. Pupil dilated anterior chamber shallow. Fields could not be taken.

L. V. = 20/200. Tn. Nasal field contracted. Optic discs in both, cupped. Iridectomy on left eye in 1898.

Operation.—Aug., 1899. Excision rt. sup. cerv. sympath. ganglion. Hyperemia of conjunctiva, flushing of side of face and increased lacrimation. No other accidents. Pupil contracted and remained so for three years. No change in fields, tension or vision. Last observation, June, 1902.

SIMPLE CHRONIC GLAUCOMA, BOTH. BILATERAL SYMPATHECTOMY. NO IMPROVEMENT.

Nos. 54 and 55.—M., aged 65. Duration between one and two years.

R. V. = F. 8 ft. T + 2. Pupil dilated and anterior chamber rather deep. Pupil concentrically contracted. Glaucoma cupping of disc.

L. V. = F. 10 ft. T +. Pupil and fields as above. Disc not distinctly seen on account of cataractous lens.

Operation.—Nov., 1899. Bilateral excision of sup. cerv. sympath. ganglion. Hyperemia of conjunctiva followed. Pupils contracted, and central vision improved slightly. Fields enlarged somewhat and then contracted to less than before the operation.

Last observation, April, 1903. Sees enough to get about.

CHRONIC INFLAM. GLAUCOMA, LEFT. LEFT SYMPATHECTOMY. SLIGHT IMPROVEMENT.

No. 56.—F., aged 67. Disease of two or three years duration in left eye.

*Journal American Medical Association, 1901.

R. V. = 20/40. Tn. Pupil normal. Fields normal

L. V. = 20/100. T + 2. Pupil dilated. Disc shows considerable cupping. Fields contracted on nasal side.

Operation.—Sept., 1899. Excision of left sup. cerv. sympath. ganglion. Slight ptosis. Increased lachrimation. Tn. Pupil contracted, Fields enlarged considerably. L. V. = 20/100.

Last observation, April, 1902. Fields slightly enlarged as compared with those before operation. L. V. = 20/100. Patient died in 1902.

ABSOLUTE GLAUCOMA, RIGHT. CHRONIC INFLAM. GLAUCOMA, LEFT. PREVIOUS IRIDECTOMY ON LEFT. RIGHT SYMPATHECTOMY. NO IMPROVEMENT.

No. 57—M., aged 58. History of painful attacks of glaucoma for over one year in both eyes.

R. V. = O. T + 3. Pupil dilated and anterior chamber shallow. No fields.

L. V. = 20/80. Tn. Fields normal. Iridectomy had been done some time before.

Operation.—Jan., 1900. Excision rt. sup. cerv. sympath. ganglion. No effect on lid, tension, etc. Pupil contracted. T + 1. No change in central vision or fields.

In two of these four cases there was dysphagia lasting several days.

DAVID WEBSTER. 1 CASE. RIGHT SIMPLE GLAUCOMA. LEFT ABSOLUTE GLAUCOMA. RIGHT SYMPATHECTOMY. TEMPORARY IMPROVEMENT. DISEASE STATIONARY.

No. 58.—M., age 49. Disease for one year in left eye and a few months in the right.

R. V. = 20/50. T +. Pupil slightly dilated and sluggish. Field up 40°, down 50°, nasal 50°, temporal 85°. White disc, with shallow excavation.

L. V. = O. T + 3. Pupil widely dilated, deep glaucoma cupping.

Operation.—Feb. 5, 1902. Excision of rt. sup. cerv. sympath. ganglion. Ptosis followed. Numbness of right side of tongue and hoarseness. T —. Contracted pupil. R. V. = 20/30. Fields improved.

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Last report Jan. 22, 1903, one year later. R. V. = 20/50. Fields about the same as before the operation. Tn. Miosis and slight ptosis.

JOHN E WEEKS. 5 CASES.* 7 OPERATIONS. SIMPLE CHRONIC GLAUCOMA. RIGHT SYMPATHECTOMY. TEMPORARY IMPROVEMENT. ACUTE ATTACK. IRIDECTOMY.

No. 59 — F. aged 56. Duration of disease 2 years.

R. V. = F. 1 foot. T + 2. Pupil dilated. A. c. shallow. Cupping of optic disc. Field for white small, color field abolished.

L. V. = 20/20. T + 1. Fields not much contracted.

Operation.—March 11, 1902. Excision of right sup. cerv. sympath. ganglion. Vision began to steadily improve and she could see colors. Fields increased markedly. Tension remained plus. April 20, 1902. R. V. = 20/70. T + 1. June 8, 1902, attack of acute glaucoma in right. V. = P. 1.

June 20, 1902. Iridectomy of right eye.

July 18, 1902. R. V. = F. 7 feet. L. V. = 20/20.

SIMPLE GLAUCOMA (ABSOLUTE), RIGHT. SUBACUTE GLAUCOMA, LEFT. LEFT SYMPATHECTOMY. IMPROVEMENT. RIGHT SYMPATHECTOMY.

Nos. 60 and 61.—M., aged 70. History of 6 months duration.

R. V. = P. 1. T + 2. Nerve white and deeply cupped.

L. V. = 20/40. T + 2. Fields contracted.

Operation.—April 1, 1902. Excision of left sup. cerv. sympath. ganglion. T—. No untoward symptom.

Operation.—April 15, 1902, on right side. No untoward results:

July 5, 1902, R. V. = P. 1. No change in fields.

L. V. = 20/20. Fields markedly improved.

SIMPLE CHRONIC GLAUCOMA, LEFT. ABSOLUTE GLAUCOMA, RIGHT. LEFT SYMPATHECTOMY. IMPROVEMENT.

No. 62.—R. V. = O. T + 3.

L. V. = 20/70. T +. Duration of disease 7 years, during which time he had used eserine. Fields greatly contracted.

*Trans. Amer. Opth. Soc. 1902.

Operation.—April 15, 1902. Excision of left sup. cerv. symp. ganglion. Tn. Pupil small. Suffusion of eye, lachrimation increased. Ten days later L. V. = 20/30 +.

July 10, 1902. Severe pain in the left side of head.

L. E. T +. L. V. = 20/20. Fields increased. No later report.

SIMPLE GLAUCOMA, BOTH. BILATERAL SYMPATHECTOMY.
TEMPORARY IMPROVEMENT. LATER IRIDECTOMY
NECESSARY.

Nos. 63 and 64.—M., aged 30. History of failing vision and increased tension in both eyes for 3 years.

R. V. = 20/40 +. T + 1.5. Pupil dilated, optic disc cupped. Fields contracted.

Operation.—April 29, 1902. Excision of right sup. cerv. sympath. ganglion. Pupil contracted. Tn. Acute attack of glaucoma was excited in left eye. L. V. = 1/200.

Operation.—May 6, 1902. Excision of left ganglion. Pupil contracted. T +. 1. Improvement in vision. T. of right eye remained normal. T. of left remained high and iridectomy was done.

July 12, 1902, R. V. = 20/20. L. V. = 9/200.

Last report, March 1, 1903. Iridectomy was done on right eye, because of periodic increase of tension and diminution of vision and visual fields. April 11, 1903, R. V. = 20/40. Tn. L. V. = F. 17 ft.

SIMPLE CHRONIC GLAUCOMA, BOTH. LEFT IRIDECTOMY FOLLOWED LATER BY LEFT SYMPATHECTOMY.
IMPROVEMENT.

No. 65.—M., aged 40. Duration of disease unknown.

R. V. = O. Absolute glaucoma. T + 3. deep cupping of disc.

L. V. = F. 5 ft. T +. Pupil shows coloboma after iridectomy.

Cupping of optic disc.

Operation.—Dec. 2, 1902. Excision of left sup. cerv. sympath. ganglion. Ptosis, suffusion of conjunctiva, increased lachrimation and nasal mucus and free perspiration on side of face opposite to side of operation, occurred. Im-

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provement in tension and vision occurred and at time of last report, three months after operation, Tn. L. V. = 20/200.

The ganglion was small, not much larger than trunk of the nerve. It was very pale in color.

MEYER WIENER. 2 CASES. CHRONIC INFLAM. GLAUCOMA, RIGHT. RIGHT SYMPATHECTOMY. NO IMPROVEMENT.

No. 66.—F., aged 50. R. V. = F. 12 ft. T + 2. Dilated pupil. Cupped disc.

L. V. = O. Phthisis bulbi. Field of right contracted.

Operation.—Winter of 1900. Excision of rt. sup. cerv. sympath. ganglion. No change in vision or tension and patient was lost sight of four weeks after operation.

CHRONIC SIMPLE GLAUCOMA, RIGHT. RIGHT SYMPATHECTOMY. NO IMPROVEMENT EXCEPT IN PUPIL.

No. 67.—F., aged 45. Duration of disease in right eye, 4 years. T + 1. Pupil dilated. Field slightly contracted on inner side.

R. V. = 6/120. L. V. = 6/6. Tn. Eye normal.

Operation.—1900. Excision of rt. sup. cerv. sympath. ganglion. No change in tension or pupil. Vision remained the same. Patient disappeared three weeks after the operation and no further report was made.

H. W. WOODRUFF. 1 CASE*. SIMPLE GLAUCOMA, LEFT. LEFT SYMPATHECTOMY, WITH TEMPORARY IMPROVEMENT. LATER IRIDECTOMY.

No. 68.—M., aged 29. Failure of right eye for 7 years after an injury. Duration in the left eye three years.

R. V. = O. Absolute glaucoma. T +. Deep cupping of disc.

L. V. = 20/40. T +. Pupil dilated. Fields contracted, cupping of optic disc.

Operation.—April 29, 1901. Excision of left sup. cerv. sympath. ganglion. Six days later ptosis, Tn., contracted pupil, improved vision. White fields that were contracted to 10° increased to 30° up, 30° nasal, 15° below and 50° tempo-

*Chicago Medical Record, July 1901.

ral with irregular outline. Later central vision = 20/20. Six months later he had return of all symptoms and failing central vision. He refused iridectomy, but later consented to it, and on Feb. 10, 1902, iridectomy of the left eye was done. Central vision improved to 20/30.

Last report, March 10, 1903, L. V. = 20/70. Tn. Field greatly contracted. Above 5°, temporal 2°, below 5°, nasal 10°.

We have here records of 68 operations done on 54 cases, i. e. 14 were bilateral. Of these operations:

38 were for simple glaucoma; 16 for chronic inflammatory glaucoma; 4 for subacute glaucoma; 3 for acute glaucoma; 4 for absolute glaucoma; 2 for hemorrhagic glaucoma; 1 for buphthalmus. Of these, five operations were preventive, one by Hale (20), four by Renaud (40, 42, 44, 46.) No glaucoma up to the time of reports. One death occurred (30). Of the 38 operations for simple glaucoma, 14 gave no improvement whatsoever. Five were temporarily improved for periods ranging from 15 days to 8 months, but had recurrent attacks that necessitated iridectomy or caused loss of the eye. Fifteen were improved as long as they were under observation for periods of from two months to two years. Of these 3 were stationary (5, 17, 58). One died (30). Six remained unimproved after iridectomy, but improved after sympathectomy. (17, 24, 18, 34, 35, 65.)

Concerning the 15 that were improved. No. 9 showed slight improvement. No. 18 improvement as to tension; previous iridectomy had been done; observation one year. No. 24, improvement as to central vision and tension. No. 29, marked improvement; observation 14 months. No. 34, previous iridectomy had been done; improvement after sympathectomy, but patient was only under observation for 15 days. No. 35, previous iridectomy; after the sympathectomy the tension remained minus. Nos. 37 and 38, slight improvement as to vision, but tension is still plus; time of observation 2 years. No. 40, improvement as to tension, slight improvement as to vision; time of observation 20 months. Nos. 51 and 52, marked improvement in tension and vision; posterior sclerotomy had been done without effect; time of observation 6 months. Nos. 62 and 65, previous iridectomy; marked improvement in tension and vision; time of observation, 4 months. Nos. 4 and 6 showed marked improvement,

and have been under observation for 9 months and 4 months respectively.

Of the 16 operations for chronic inflammatory glaucoma, 6 showed no improvement; 3 showed improvement for periods from 2 to 3 months (2, 31, 50); 4 were improved as long as they were under observation, 1 (45) 5 months, 1 (15) 18 months, 1 (41) 1 year, 1 (36) 3 years. Of these 1 (15) had been unbenefitted by iridectomy but greatly improved by sympathectomy; 18 months under observation. Three (20, 42, 46) were preventive and disease had not appeared at 3 months, 8 months and 1 year after operations. Of the four that showed improvement, No. 15 is the most interesting, because an iridectomy failed to check the disease, but sympathectomy produced marked results in central and peripheral vision. Time of observation 18 months. In No. 36, improvement in central vision continued after 3 years; tension slightly plus. In No. 41, improvement continues after 1 year. In No. 45, vision and tension were improved and pain was relieved; time of observation, 5 months. No. 20 is interesting in that the operation was done for threatened glaucoma. In Nos. 42 and 46 it is not stated whether the bilateral operation was done to influence more profoundly the diseased eye or to prevent the occurrence of the disease in the perfectly sound eye. The same may be said concerning cases 39 and 44, in which one eye was normal in every respect.

Of the four operations for sub-acute glaucoma. 1 (12) cured at the end of two and a half years.—Black. 2, (27, 28), remained well at end of 15 months.—LaMotte. 1, (60), remained improved after observation of 4 months.—Weeks.

Of the three operations for acute glaucoma. 1, (26), recovered; observation 15 months.—LaMotte. 1, (43), improved; remained so after nine months.—Renaud. 1, (44), preventive; no attack occurred.

Of the four operations for absolute glaucoma. 1, (8), improved as to pain. 3, no improvement and no change.

Of the two operations for hemorrhagic glaucoma. 1, (11), improved as to pain. 1, (33), improved vision during time of observation; 5 months.

One operation for buphthalmus had no effect.

SUMMARY.

Form of Glaucoma.	No. of Cases.	Improved.	Temporarily Improved.	Stationary.	Unimproved.
Simple Chronic	38	15	5	3	15
Chronic Inflammatory	16	4	3	3	6
Sub-acute	4	3	1		
Acute	3	1	1	1	
Absolute	4	1			3
Hemorrhagic	2	2			
Buphthalmus	1				
	68	26	10	7	25

After these 68 operations myosis is mentioned as occurring 40 times, and this condition remained for periods ranging from 3 days to 3 years. In most cases it seems to be permanent. It is mentioned that in 34 cases the tension was reduced to normal and in 9 others it was much lower than it was before the operation. As to the effect of the operation on the lid, conjunctiva, face, etc., ptosis occurred in 36 cases and lasted for periods ranging from 13 days to 1 year. This, like myosis, is one of the most constant phenomena. Conjunctival congestion was noted in 19 cases, lasting for a variable time, usually not longer than a few days. One case persisted for three months. Increased lacrimation was observed in 18 of the cases. This was of short duration but in one case lasted three weeks. Congestion of the face on the side operated on was observed 6 times, in one case lasting three months.

Neuralgia and hyperesthesia of the side of the face operated on, was noticed in 6 cases, lasting in one case for one year. Anesthesia of the face or neck on the operated side was mentioned in only two cases, in one of them it lasted 3 months. Hoarseness or aphonia occurred in 8 cases lasting for a variable time from 1 week to 3 weeks. In two of the cases dysphonia was the result of paralysis of the recurrent laryngeal and lasted in one for nine months, and in the other for two years. Dysphagia was observed in 5 cases as a result of the operation. This symptom lasted only 2 or 3 days except in one case in which it persisted for 6 months. In one case (5) for a period of several days after the operation the patient had mild hallucinations.

The results exhibited in this series of cases, at first glance do not seem as favorable as those presented by Rohmer,* who

*Annales d'Oculistique, May, 1902.

drew conclusions from a study of 74 cases collected by Bichat to which he added 20 of his own. On these 94 cases, 114 operations were done. The following table gives a summary of the results of the analysis of these cases:

Form of Glaucoma.	No. of Cases Operated on.	Improved.	Negative.	Worse.
Simple chronic	43	36	5	2
Chronic inflammatory	34	23	10	1
Sub-acute	14	6	6	2
Acute	9	4	5	
Absolute	3	1	2	
Hemorrhagic	5	5		
Hydrophthalmus	6	4	1	1
	<hr/> 114	<hr/> 79	<hr/> 29	<hr/> 6

The statistics of Ziehe and Axenfeld who studied the results in 55 cases agree with this in the main, for many of the cases in each series are the same. Unfortunately many of these cases as in the present series, either do not give the final result, or were under observation such a short time as to make any statement as to the final outcome impossible. Again in studying them it is seen that the records of many of them are far from exact.

However, to quote Axenfeld, "there is obtained by this operation in a certain proportion of cases, of simple glaucoma, a definite and important result, and in some instances there has been a decided improvement, even where a previous iridectomy had failed." Such cases as those reported by Grunert, Demichieri, Cutler, Starr and Weeks, in which sclerotomy and iridectomy had been unsuccessfully performed, and sympathectomy accomplished not only reduction in tension but improvement in both central and peripheral vision, speak strongly in favor of the operation in certain cases.

As was said in the beginning I feel that positive conclusions are not yet to be reached, and will not be until more carefully selected cases can be studied for longer periods of time.

The operation in itself, while a major one, is not to be considered one of unusual danger, and with modern technic should show a very trifling mortality. The death recorded in our present series was purely accidental, and might have occurred in any other operation on the neck. With such brilliant results before us as are presented in certain cases on record, we must agree that sympathectomy is not an operation to be condemned too hastily. Certainly it is not fair to condemn it when it fails to restore sight to an eye that has

suffered so long from glaucoma that it is blind from atrophy of the nerve, or when it fails to check pain in an eye that is hopelessly lost from absolute glaucoma.

If it is to be compared with iridectomy at all, it should be given an early trial in any form of the disease in which it is applicable.

The statistics up to date seem to indicate that the simple chronic form is the one most suited for it next to the hemorrhagic form, if that can be determined. As a guide for my own practice, I should feel very much like following Abadie when he says: "In acute forms of glaucoma and in subacute with intermissions, practice first iridectomy, and if it fails do sympathectomy. In simple glaucoma use miotics twice a day, if they suffice, continue them; if in spite of their systematic employment the vision fails, do sympathectomy."

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ARTERIO-SCLEROSIS AND ITS BEARING UPON CERTAIN LESIONS OF THE RETINA AND OPTIC NERVE.

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We are all familiar with the usual ophthalmoscopic picture of endarteritis and endophlebitis of the retinal vessels, and with the occasional results of such endovasculitis in the guise of hemorrhages of various forms into the tissue of the retina, and even into the vitreous. But it has seemed to the writer that we have devoted so much attention to the pathology of this condition, that we have rather lost sight of the clinical side of the question, and more or less ignored the more distant, far-reaching effects of such vascular changes upon the functional powers of the eye.

We recognize certain changes in the retinal vessels, characterized by the appearance of white stripes along the vessels, and we know that this means that the walls of the vessels have become visible through inflammation by some inflammatory exudation, which has converted them into an opaque whitish tissue. We look upon this as an evidence of general arterio-sclerosis, and do not associate these signs with inflammation of the retina or chorioid. There may be undue tortuosity or alteration in the size and breadth of the arteries in places, which cause them to present a beaded appearance. There are alterations in the reflections from the arterial walls and in the translucency of these walls caused by actual degenerative changes in the arterial walls, and infiltration into the perivascular lymph-sheaths. We are also familiar with the signs of an impeded venous circulation, where a diseased artery crosses a vein, caused by the pressure of the artery with its thickened coats on the vein, and thus contracting its calibre. We also recognize that such a condition of the retinal vessels is of importance as an indication of similar conditions existing in other parts of the body. When this condition is observed in the eye, whether accom-

panied by retinal hemorrhages or not, it is often a warning signal of impending cerebral apoplexy. Such vascular degeneration is frequently met with in renal diseases, but we have learned to look upon it as the cause and not as the result of nephritis. It also arouses the suspicion of the existence of diabetes, for we know of the frequent association of nephritis with the late stages of diabetes.

It seems possible from the later investigations of Raehlmann, that a differentiation may be made between sclerosis of the adventitia and that of the intima, pathologically if not clinically. The proliferation in the adventitia appears like a "cloudy tube" around the vessel, which in extreme cases makes the entire vessel appear like a white cord. We are familiar with these changes in cases of retinitis albuminurica, and we find these also in young persons with hemorrhages into the retina.

The disease of the retina is a proliferation which may double the thickness of the wall, and narrow or close the lumen, without being visible with the ophthalmoscope. It turns the vessel into a homogeneous tissue, which optically is the same as the retina. These changes are not demonstrable by the ophthalmoscope, and can only be surmised by an increasing diminution of the blood column for short distances. Another point brought out by Raehlmann is the close resemblance between closure of the lumen of a vessel by embolus or thrombus, and the same condition due to endarteritis obliterans nodosa. He has proved by the microscope that this condition may occur without a thrombus, by proliferation of the intima and complete closure of the lumen of the artery, with all the subjective symptoms of sudden blindness from embolism.

Microscopical examination of cross sections of the optic nerve in these cases has shown that the vessel walls are most frequently involved at the point of bifurcation. The vessels in front of these points are dilated, so that the vessel sometimes appears like a string of beads. The veins are also often dilated, mainly in the peripheral branches, and especially where veins and arteries cross each other, and their calibre is sometimes entirely lost.

A very thoughtful and suggestive paper on this subject of arterio-sclerosis has been published by Adler, in the New York Medical Record, for May 10, 1902. He calls atten-

tion to the important fact that arterio-sclerosis and interstitial induration invariably go together. In all instances of arterio-sclerosis, the process is not confined to the bloodvessels, but the tissues of the parts supplied by these vessels participate in the form of interstitial inflammation or proliferation, ultimately leading to fibrosis, circumscribed or diffuse.

We are told that arterio-sclerosis begins in the smallest vessels, and thence extends to the larger branches. The sclerosis of the arterioles and the resulting fibrous induration of the parenchyma cause the local increase in the blood pressure, and the retardation of the blood current. There are many important clinical changes in the metabolism of persons of advanced age, and senile arterio-sclerosis and fibrosis is the most frequent and typical of these changes. Adler believes it possible that definite local or systemic metabolic derangements may be conceived as a cause for indurative and degenerative lesions in vessels and connective tissue. They occur almost regularly in gout and very frequently in rheumatism. But these changes are by no means always associated with advanced age, for they have been met with in the vessels in youth, childhood and even infancy. The recognition of localized retinal arterio-sclerosis in young persons is a difficult task, for there is no single symptom always present which can be regarded as pathognomonic. Adler himself calls attention to the fact that the increase of blood pressure, so long regarded as characteristic of arterio-sclerosis, is by no means a constant symptom.

For some time pathologists and clinicians have recognized three distinct types of arterio-sclerosis; the cardiac, the renal and the cerebral.

1. In the *cardiac* type the early clinical symptoms are almost nil, though there may be bradycardia.

2. The *renal* type is characterized by occasional headaches, urine of low specific gravity, with a trace of albumen and constantly granular casts.

3. In the *cerebral* type we meet with diffuse headaches, vertigo on change of position of head or eyes, which may end in cerebral hemorrhage and softening. The co-existence of indurative processes in the brain is proved by a train of psychic disturbances, such as failure of memory, irritability, and various forms of senile dementia. Adler is inclined

to add a fourth type of arterio-sclerosis, the *spinal*, in which the symptoms simulate those of tabes, but differ from the latter in the lack of progressiveness, and in the absence of all typical sequence of symptoms.

I think it may be conceded that we are fairly familiar with the effects of arterio-sclerosis upon the retina and the clinical symptoms observed in these cases. The microscope has also revealed to us the pathological condition of the vessels and tissue of the retina underlying these clinical symptoms. But of the more far-reaching effect of these lesions upon the optic nerve, our knowledge is less accurate. One of the first to call attention to changes in the optic nerve as the result of arterio-sclerosis was Otto (see a brief paper in the *Archiv für Augenheilkunde*, Vol. 43, 1901). He describes cases of circumscribed atrophy of the optic nerve caused by a sclerosis of the internal carotid and ophthalmic arteries, which induced dilatation of the breadth of these vessels in places, hardening of their walls and pressure on the optic nerve by mechanical means. Sections of the optic nerve in these cases showed the effect of pressure by the enlarged carotid and ophthalmic arteries on the optic nerve behind the foramen, in the form of flattening and incurvation of the nerve as a whole, and flattening of the central nerve-fibre bundles and circumscribed atrophy of the central and marginal nerve-fibre bundles. He also traced out both ascending and descending atrophy of the nerve fibres in these cases. He affirms that the flattening of the central nerve-fibre bundles on both sides, distal and proximal, of the atrophic zone, corresponding to the pressure of the enlarged vessels, is always present.

The typical form of the first appearance of this change in the optic nerve is the flattening of the central nerve-fibre bundles. Secondary changes subsequently show themselves in the optic papilla, but these visible ophthalmoscopic signs are always anticipated by failure of vision and defects in the visual field.

From the clinical stand-point we know very little of the effects of this arterio-sclerosis on the optic nerve and its functions, and many of our cases furnish very contradictory evidence. We have all seen cases of absolute central scotoma, with no demonstrable ophthalmoscopic change in the retina or disc. We occasionally meet with paracentral

scotomata, eccentrically inward from the optic nerve, with no ophthalmoscopic change. There are not a few cases of temporal limitations of the field of vision, with pale optic discs, but with perfect central visual acuity. If in such cases we can find no cause for the defects in the visual field except the presence of arterio-sclerosis, may we not be justified in regarding the arterial condition as a cause.

If in addition to the defects in the field of vision, there are marked impairment of vision and marked discoloration of the optic disc, and no cause for these conditions can be found in the brain or nervous system, I am inclined to look upon the existing arterio-sclerosis as the cause. I am very strongly disposed to regard many of the cases of so-called simple chronic glaucoma as cases of atrophy of the optic nerve due to retro-bulbar arterio-sclerosis of the ascending internal carotid, or ophthalmic artery, or anterior cerebral artery, which by pressure on the optic nerve posterior to the foramen, has caused the descending atrophy.

Liebrecht (Archiv für Augenheilkunde, vol. 44, 1901-1902) has called attention to what he believes to be the effect of arterio-sclerosis on the optic nerve, with special references to the field of vision and the visual acuity, and asserts that the following injuries to the functions of the optic nerve may occur.

1st. In the frequent "middle furrow" formation in the optic nerve at the point of entrance of the ophthalmic artery, the resulting scotoma in the field of vision will be found close to or removed from the fixation point, according as the ophthalmic artery has entered the optic nerve in the center or laterally. This atypical position of the scotoma points to arterio-sclerosis as the cause.

2nd. The widely extended pressure on the optic nerve at the inner edge of the ligamentum clinoideum by the ascending rigid diseased carotid would cause partial or complete atrophy of the optic nerve, and the usual effects on vision and the visual field.

3rd. A partial atrophy of the optic nerve within the cranial cavity, not discernible with the ophthalmoscope, might be caused by pressure of the diseased rigid vessels in crossing each other's course. The resulting disturbance of function would depend on the relative anatomical position of these vessels. But this atrophic zone in the optic nerve ex-

tends at first but a short distance in the distal direction, and we are justified in assuming that atrophy of the disc, demonstrable by the ophthalmoscope, is only met with in very chronic and advanced cases.

For some years the writer has been convinced that arterio-sclerosis of the ophthalmic and internal carotid arteries may affect the optic nerve more frequently and seriously than we have hitherto suspected. I have no certain data corroborated by autopsy, in regard to these lesions, which would transform a theory into a fact. The slight initial effect of pressure by the sclerosed vessels on the optic nerve, which Liebrecht calls the "cicatricial fold" or "furrowed formation," would probably cause no great visual disturbance, though it should give rise to a paracentral scotoma. The atrophic zone must diminish rapidly in extent in both directions. But if the sclerosed condition of these large vessels increases and extends, the pressure on the nerve would correspondingly increase and would certainly cause impaired vision and eventually complete amaurosis by flattening of the nerve, such as we sometimes find at autopsies in cases of tumors of the chiasm or of the anterior lobe of the brain.

In some of the cases which have been under my observation for years, with the presence of scotoma and increasing loss of sight, there have been no evidences of arterio-sclerosis of the retinal vessels as long as they were under observation, until the atrophic process reached the disc.

The location of the pressure points would naturally vary with the course and distribution of the vessels in individual cases. It might be in the prolongation backward of the long optic canal toward the skull, where very often the ophthalmic artery enters the optic nerve in a longitudinal direction. It might occur near the upper sharp border of the fibrous optic canal, where the optic nerve is broadly pressed upon by the ascending carotid. Or finally it might occur midway between fibrous canal and the chiasm, at the point where the carotid and the anterior-cerebral artery cross above and below the optic nerve.

Wherever the location of the pressure, the resulting atrophy, of the nerve is at first a pure "pressure atrophy," which is propagated downward and forward toward the disc, and upward and backward towards the chiasm. Later in the course of the disease, there is probably added to the

"pressure atrophy" a secondary proliferation of connective tissue between the nerve fibre bundles, which induces a more extensive atrophy, and perhaps the development of new vessels. The atrophic zone at first extends but a short distance in both directions from the zone of pressure. Where it actually reaches the disc, we must assume the existence of a secondary complicating atrophy in the optic nerve, the result of connective tissue proliferation.

The *therapeutics* of arterio-sclerosis are still in their infancy. It is doubtless true that when that stage in the progress of the disease has been reached, when we are enabled by the ophthalmoscope to recognize the evidences of the lesion in the disc and retina, the process must be already far advanced. In the present state of our knowledge we can not expect to restore the calibre of the diseased vessels, or to reduce the infiltrated and indurated tissues to their normal condition. All that we can hope to do is to arrest the progress of the disease and limit its extension. The correct recognition of the nature of these cases is therapeutically important for in the long-continued use of the iodides, especially iodide of potassium, we have an excellent means of arresting the changes induced by arterio-sclerosis, or at least of retarding the extension of the lesion. Where the toxic influences, leading to its development, are known, they should be primarily dealt with, and any therapeutical measure instituted may be greatly assisted by a carefully regulated dietary.

A CASE OF MICROPHTHALMOS WITH ORBITAL CYSTS.*

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HISTOLOGIC STUDY BY

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Microphthalmos with orbital cysts is a rare anomaly, and the opportunity of examining the eyeball and the cysts with their relations undisturbed is exceptional.

The following case was seen in the practice of Dr. Alfred M. Seymour of Fort Washington, Pa., through whose kindness and tact we were enabled to secure the specimens. The subject was a full term female baby which had lived 36 hours. Its parents were healthy Americans.

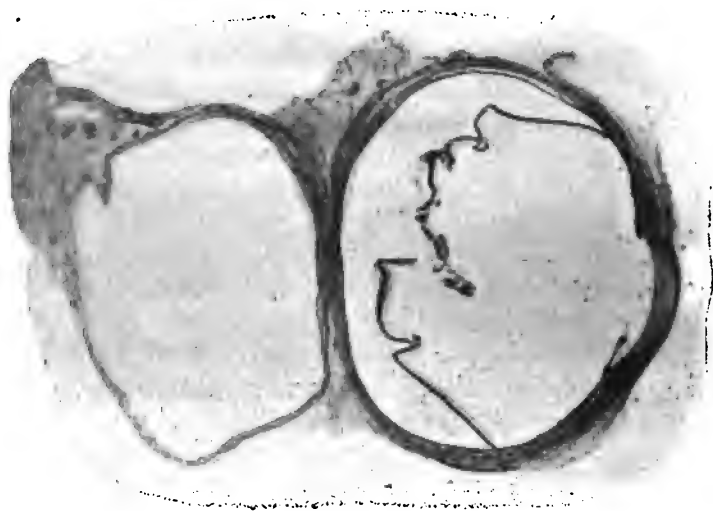
The post mortem was made by Dr. Charles W. Burr, who kindly dictated the notes relating to the calvarium and brain. The anterior fontanelle was almost entirely filled by Wormian bone. The skull was of normal thickness and the meninges showed nothing abnormal. With the exceptions to be noted the brain appeared normal. The optic foramen and the optic nerve on the left side were of normal size. There was no optic foramen on the right side. The optic chiasm and the external geniculate bodies were absent.

The eyes were removed by breaking through the vault of the orbits. The orbits presented no abnormalities, and

*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

viewed anteriorly the globes were so deep seated that they appeared to be absent; but they could be detected by palpation.

On the right side the margins of the lids had not entirely separated. Dr. Seymour stated that they had been completely and firmly adherent for some hours after birth. On the right side the palpebral fissure was horizontal, on the left side it was obliquely placed and there was a coloboma of the upper lid involving the entire width of the lid for a dis-



tance of five millimeters to the nasal side of the median line.

On the left side there was a broad cleft in the upper lip extending to a point slightly above the ala of the nose. The alveolar process presented a cleft at a corresponding position and there was a furrow extending from this point backward to the edge of the hard palate. On the right side there was a complete cleft in the soft palate and for a short distance into the hard palate.

There were supernumerary auricles on both sides. On the right side there was but a single teat-like projection while on the left side there were three lobules.

Various views have been held regarding the origin and development of these cysts.

The fact that they are invariably associated with either microphthalmos or anophthalmos early gave rise to the supposition that they develop independently of the globes, the growth of which they check. Histological study has shown this view to be untenable, as the cysts have always been found to be connected anatomically with the globe, the latter presenting anomalies in its development. The theory



advanced by Arlt is that they are due to a failure of closure of the fetal cleft or to bulging of the inferior wall of the globe which does not afford proper resistance to the intraocular pressure because of the absence of the chorioid and partial defects in the retina and sclerotic. Kundrat would explain them by supposing that the tissues of the primary optic vesicle projecting through the fetal cleft become surrounded by mesodermic tissue and being thus segregated continue to proliferate and form cysts, the primary defect being in the development of the cerebral vesicle. The fact that the

retinal elements have been found reversed within the cyst has been considered a significant point in favor of this theory.

Ginsberg assumes that a portion of the ectoderm becomes constricted by the mesoderm. As a result of this segmentation of the ectoderm the chorioid and in part the sclera fail to develop. Should this occur in the median line in-



Showing folding of retina and circular arrangement of the nuclear layer.

feriorly, that is in the position of the fetal cleft, a cyst is formed into which, as the result of intraocular pressure and the absence of supporting structures, the inner layer of the vesicle is forced. He believes however that the disturbance of development begins when the eye is still in open union with the central nervous system before the formation of the secondary optic vesicle.

Von Hippel points out that the inversion of the retinal elements within the cyst does not compel an acceptance of the view that the primary defect leading to the development of these cysts lies in the primary vesicle. He thinks that in the dragging in of the retina it may become turned inside out as are the fingers of a glove in drawing the glove off the hand.



Showing cyst cavities in nerve fibre and folding of retina;
also modified vitreous.

Collins who has examined seven eyes presenting this anomaly says that, "In all the specimens which I have examined the changes are best explained by considering the inner layer of the secondary optic vesicle to have become rucked and folded, due to some imperfect development of the vitreous humor or delayed closure of the cleft, that as a result of this rucking and folding, a portion of the inner layer of the secondary optic vesicle has

become extruded through the fetal ocular cleft into the subjacent mesoblast, where in some cases it has subsequently become expanded into one or more fluid containing cysts."



Columnar cells resembling those of pars ciliaris and arrangement of these cells in folds resembling the ciliary processes.

HISTOLOGIC STUDY.

The specimen which I wish to describe in detail as regards its histology, was removed post mortem from a child which died within a few days after birth. Both orbits were eviscerated at autopsy. The entire specimen was placed in five percent. formalin solution in which it remained for an indefinite period to facilitate the hardening process, the completion of which was accomplished by placing it in alcohol. Celloidin was then used to embed the specimen after which it was cut. The sections were from 20 to 25 microns in thickness and every fifth section was selected for staining. The stains employed were hematoxylin-eosin, Mallory's phosphotungstic acid hematoxylin, Weigert's stain for elastic tissue, and Van Gieson's stain.

Right Eye.—In the right eye a single cyst was encountered, situated at the temporal side and below the nerve, firmly united to its sheath and to the globe. It measured 7.5 mm. in its horizontal equatorial diameter; 6 mm. in its vertical equatorial diameter; and 6 mm. in its antero-posterior diameter. The first section of the right eye was made through the largest portion of the cyst and center of the globe at an angle of about 120° . The section through the remaining portion of the cyst and the optic nerve was made at an angle of 60° .

The interior of the cyst was made up of a transparent



Fig. 1. Inner wall of cyst showing lengthening of the nuclear bodies and their processes resembling the retina at the position of the ora serreta.

colorless fluid and a firm, white, cheesy substance that was adherent to the cyst-walls and had undergone contraction. No analysis of the cyst-contents was made but they were in all probability composed largely of hardening fluid.

Microscopic examination of this single cyst shows the thin cyst-wall to be composed of fibro-elastic tissue continuous with that of the sclera. The structure of the wall and its thickness are subject to considerable variation. At times the fibrous connective tissue is in excess; at others the cells predominate; and at the point where the cyst-wall becomes continuous with the globe, the cells assume new characteristics.

The lining of the cyst resembles at times the structure of the retina. It is composed of cells of the same character as

those that form the nuclear layer, connective-tissue cells, pigment, and a fine reticular intercellular net-work; the whole of which is enclosed within a limiting membrane. The resemblance of this structure becomes most marked at its junction with the globe and ends very shortly afterward. The membrane then passes through transitional stages similar to the retina at the ora serrata. Immediately following the transitional portion is encountered a layer of cells resembling the tall columnar elements which form the inner layer of the pars ciliaris. They are continued for a short distance as a flat layer after which they are thrown up into folds resembling somewhat the ciliary processes. These cells do not retain their columnar shape constantly but at times become polyhedral forming a mosaic several layers deep. Beneath this layer lie the pigmented epithelial cells.

The globe of the right eye proved to be almost spherical; it measured 9 mm. in the horizontal equatorial diameter; 8.5 mm. in the vertical diameter; and 8 in the antero-posterior diameter. The cornea was relatively thick but its curvature was increased very slightly if at all. It measured 2 mm. in the horizontal diameter and 2 mm. in the vertical diameter. The lense was spherical and hard and was dislocated in making the section. The retina was detached posteriorly; folded upon itself many times and apparently attached only at the ora serrata.

A microscopic examination of the globe revealed the following conditions: The cornea is relatively thick and opaque and its anterior elastic lamina is absent. The epithelial layer is thick and the base line is irregular. The substantia propria is unduly cellular throughout, particularly anteriorly, and thin walled blood-vessels course throughout the anterior layer. The posterior elastic lamina is absent. In the endothelial layer, the cells are irregular in outline and granular and the layer is 4 or 5 cells in thickness. Those cells next to the substantia propria are fairly regular in arrangement but the succeeding posterior cells are piled one upon the other without order. With a special stain (phosphotungstic acid hematoxylin) two thin lines may be detected enclosing a row of endothelial cells between them. The appearance thus presented corresponds closely to Descemet's membrane particularly as regards its position. It is seen only by playing the micrometer screw and when lost the rows of cells appear in the field.

The angle of the anterior chamber is occupied by a coarse reticulum composed of nucleated trabeculae, the large spaces (probably Fontana's spaces) formed containing single, round mononuclear cells. Several blood spaces are seen in this region any one of which may represent Schlemm's canal. The ciliary bodies are long, thin, and undeveloped. The ciliary processes are marked only by an exaggeration of the already thickened pigment layer and present nothing striking in appearance. The retina is disproportionately developed and is detached throughout its entire extent except at the ora serrata. Large empty cyst-cavities may be demonstrated in the nerve fiber layer. In various parts of the retina, the internal nuclear layer is greatly increased in thickness giving rise to irregular enlargements. Within these enlargements are found empty spaces some of which are devoid of any definite wall except a faintly stained homogeneous line that appears to be a part of the reticular ground-work in which the cells lie. In the largest cellular group there is a space larger than any of these just described, the walls of which are formed by two layers of irregularly arranged nuclei, corresponding to the internal and external nuclear layers of the retina. The external half of the wall is so deeply pigmented that the cellular structure is almost obscured. This space apparently has no internal limiting membrane as the others have and contains a faintly staining fibrillar mass within it. In another portion of the retina, in which there is a break in the continuity and regularity of the structure, there is an increase in the number of cells of the internal nuclear layer, apparently an attempt at the formation of a larger ring composed of two rows of cells. In this instance the external walls are not continuous. The ring appears to have been bitten off the retina. At another break in the retina there is a large ring with deeply pigmented walls (the internal in this case); alongside of this is a large space without definite walls or limiting membrane. Internal to this entire group, i.e., in the vitreous cavity, is a large body composed almost entirely of thin-walled blood-spaces; the blood vessels could not be traced owing to the method of sectioning but they appeared to be a part of the modified vitreous. Both nuclear layers are deeply pigmented, especially the external. Many of these appearances are in all probability due to the folded condition of the retina but this positively fails to account for all of them.

Left Eye:—In the left eye a double cyst was encountered, the larger portion of which measured 3.7 mm. in the horizontal equatorial diameter; 4 mm. in its vertical equatorial diameter; and 5 mm. in the antero-posterior diameter; while the smaller cyst measured 3 mm. in the horizontal equatorial diameter; 3.5 mm. in the vertical equatorial diameter; and 3.5 mm. in the antero-posterior diameter. The cyst-walls are composed of fibro-elastic tissue and in this specimen the nuclear cells lining the walls predominate and are almost continuous throughout the wall. There is no internal limiting membrane. Many cells are pigmented and free pigment is also visible. In the smaller cyst fibrous septa arise from the walls and extend into the cyst-cavity terminating in free extremities within it. The layer of cells is interrupted at this point. The cyst contains a small amount of homogeneous material. There is no communication between the cysts and the vitreous chamber of the globe nor is there any communication between the cavity of the cyst and the nerve sheath. This applies also to the cyst in the right eye.

The globe measures 10 mm. in the horizontal equatorial diameter; 9 mm. in the vertical equatorial diameter; and 9.5 mm. in the antero-posterior diameter. The horizontal diameter of the cornea is 3 mm. and its vertical diameter is likewise 3 mm. The description herein given is that of a section stained with hematoxylin and eosin.

Microscopic examination showed the presence of small bud-like masses of brownish green pigment on the external surface of the corneal epithelium. The anterior elastic lamina is absent. In the anterior layers of the substantia propria, thin-walled blood-vessels may be seen. This condition is not as well marked as in the right eye nor is the substantia propria as generally cellular as in that specimen. The posterior elastic lamina is absent. The endothelial cells covering the posterior surface of the cornea have the same arrangement as in the first specimen. Thin-walled blood-vessels representing traces of the pupillary membrane and free pigment are seen in the anterior chamber. The trabeculae seen in the angle of the anterior chamber in the right eye are not encountered in this specimen. The canal of Schlemm is marked by several vessels filled with blood. The spaces of Fontana cannot be seen. The ciliary processes are

well formed. The retina is attached only at the ora serrata and is folded and puckered. The cystic changes in the nerve-fiber layer are more marked in this than in the first specimen. The cellular rings noted in the right eye are not as numerous but are more perfect and have a well-marked internal limiting membrane. The layer of rods and cones is represented by a fine fibrillar net-work in both eyes. This substance is also scattered throughout the vitreous chamber and is probably the "atypical vitreous" described by Hess. Internal to the retina at one point is seen a more or less tubular arrangement of this material: some of the tubules being empty. There are no changes in the nerve worth noting.

CONCLUSIONS.—In both eyes a tendency toward cystic changes of the imperfectly developed eyes is manifest. This is shown macroscopically by the large cysts and microscopically by the cystic changes in the ocular tunics. The microscopic changes of special interest are: Cyst cavities in the nerve fiber layer, the regular cystic enlargements composed of the nuclear layers and the fibrous septa extending from the wall of the small cyst into the cavity, all of which I believe are intimately related. The presence of the retinal elements in the large cyst-walls and the striking histologic resemblance between the lining membrane of the cyst and the normal retina and its transition into folds composed of cells similar to those of the ciliary body at a corresponding situation indicate the tendency toward the formation of a supplementary eye.

BLASTOMYCOSIS OF THE OCULAR STRUCTURES, ESPECIALLY OF THE EYELIDS.

BY CASEY A. WOOD, M. D., D. C. L.

CHICAGO.

Some thirty-five cases of blastomycetic lesions of various human organs, internal and external, have been recorded in literature since T. C. Gilchrist described an example of it, on the back of a man's hand, in May, 1894. This observer was the first to recognize a distinct skin disease due to a yeast-like fungus. He named the tumor-lesion *blastomycetic dermatitis*, and this term is certainly appropriate as describing the alterations in the skin, the locality commonly preferred by the fungus.

It is perhaps an accident, but nevertheless one worthy of remark, that so far this condition is either almost exclusively an American disease (the great majority of the cases having been observed and investigated in Chicago, especially by Nevins Hyde and F. H. Montgomery) or its true character has been appreciated only by American surgeons. The infection in even foreign-born patients (treated in Chicago) was shown to have occurred after immigration to this country.

The following brief history of a case of *blastomycosis of the left lower lid* in my own practice is presented as an introduction to a study of the disease in the eye structures.

Mary Ryan, aged 14, had never before suffered from an eruptive disease and there is no history or other evidence of syphilis or tuberculosis. She appears to be a perfectly healthy girl. Three months ago (July, 1903) she noticed a small growth, like a sty, on the central margin of the left lower lid. This formed a scab which, when removed, left a raw, discharging sore.

The growth is now about the shape and size of a large peanut, 27 by 5 to 7 mm. long and 3 mm. thick, with abrupt, rounded walls of apparently normal but reddened skin. At

the intermarginal space the growth has destroyed the dermal edge and the conjunctiva is red and thickened. The surface of the tumor, as well as its margins, is uneven, exhibiting many minute openings, through which a whitish fluid discharges, or can be squeezed. The tumor-mass is soft and compressible and does not present the hardened, ulcerated, nodules of epithelioma, or the half-healed, raw patches of dermal tuberculosis.



Blastomycosis of lower lid. Author's case.
Fig. 1. + 50. Showing epithelial proliferation and miliary abscess.

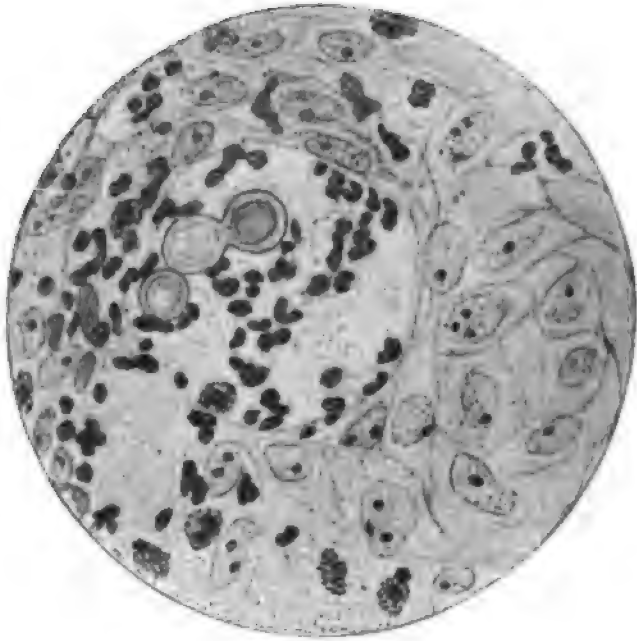
The *palpebral conjunctiva* is red, swollen and granular, but there is no abrasion or other lesion of that membrane.

The *ocular conjunctiva* is injected for about three-fourths of its extent. The lower lid margin forms the upper wall of the tumor and at some points the latter overrides the conjunctiva. The mouths of the Meibomian ducts and the cilia follicles are invaded by the growth; but few lashes are to be seen.

The cornea was clear, the pupil reflexes were normal and

vision was nearly 6/6. There was a slight mucoid discharge, with some secretion remaining in the lower conjunctival sac. The patient did not complain of pain in the eye at any time, nor did she suffer from much discomfort except foreign body sensations, burning, smarting and occasional blurring of vision. The lids adhered in the morning and a slight crust was attached to the cilia.

There was no eruption or tumor elsewhere on the patient's body.



Blastomycosis of lower lid. Author's case.

Fig. 2. + 600. Showing three organisms in a miliary abscess.

As the eye had been diligently poulticed day and night for some time before I saw the patient I decided to wait for a day or two before making a diagnosis. The diseased skin and conjunctiva were bathed four times daily with a 1 per cent. salt solution, dried thoroughly, and anointed with a 1 per cent. ichthyol mixture in lanolin. When the patient next presented herself the tumor surface was cleaner and its structure better defined. Its clinical appearances still less

than ever justified a diagnosis of either tubercle, syphilis or epithelioma. The patient was eventually seen by Dr. W. A. Pusey, who found in it the organisms proper to a *blastomycetic dermatitis*. I am much indebted to him for a photograph (Fig. 3) and for his diagnosis of the skin lesion. Dr. Pusey, at my request, has since treated the case, with *large doses of potassic iodide internally* and *regular exposure of the growth to the Roentgen rays*. The growth has slowly decreased in size and has now almost disappeared.



Fig. 3. Blastomycosis of the left lower lid before treatment with the Röntgen rays. Author's case.

After ten days treatment I desired to supplement Dr. Pusey's examination of the discharges by a histological investigation. I excised a portion of the tumor which Dr. Ludwig Hektoen kindly examined. In his report he says: "The section of the blastomycetic growth on the left lower lid which you sent me the other day shows the typical lesions of blastomycosis. There is great and irregular proliferation of the epithelium, and the intervening connective tissue is infiltrated with various forms of cells, scattered among which are occasional giant cells. Here and there, both outside as well as in the

epithelium, occur small aggregations of polymorphonuclear leucocytes—the so-called miliary abscess. In one of these I have found three typical double-contoured organisms.

The drawings reproduce the microscopical findings. Fig. 1 (low power) shows great epithelial proliferation with cellular infiltration of the connective tissue, and small abscesses. Fig. 2 (high power) shows a small, so-called miliary abscess with leucocytes, and three double-contoured organisms, two being about to separate after reproduction by budding."

I have very briefly abstracted the following additional



Fig. 4. Blastomycosis of the left lower lid, after 20 days treatment with the Röntgen rays. Author's case.

cases of blastomycosis in which the eye was involved. Six of these have been published. I am indebted to the gentlemen named for the opportunity to add two more unpublished cases to this list. The diagnosis in each instance was made by microscopical examinations, cultural experiments, animal inoculations, and other appropriate means.

CASE I. Gilchrist and Stokes. A man, 33 years of age, in good health. History negative. Disease began eleven years before he was first seen, as a papule on the *left* mastoid process. Thence it gradually extended to the face and chin, encircling the ear, involving the *supraorbital region and pal-*

pebral skin. Finally it crossed the nose to the right side of face, presenting lesions similar to those on the left side. Eventually the disease spread to other parts of the body.

CASE II. Practice of Dr. W. E. Coates, Chicago. The patient, a healthy married man, age 38, was seen in February, 1900. In January, 1898, when recovering from an attack of rheumatism, he was attacked by what was diagnosed as pleuropneumonia. This was followed by a *small nodule on the right lower eyelid*. The growth was removed but other nodules, at different times, appeared elsewhere.

CASE III. Practice of Dr. F. H. Montgomery and Dr. Oscar Dodd, Chicago. Man, age 38. Lesion appeared in a



Fig. 5. Case IV. Facial involvement in a fatal example of blastomycosis. Photograph by Dr. Jas. W. Walker. Hyde-Montgomery.

cut on his chin. Eighteen months afterward it had extended over the left cheek to the nose, had surrounded the left orbit and involved both *upper and lower eyelids, the cicatricial tissue producing eversion of the lower lid*. Treated with iodide of potassium. Progress of disease arrested and verrucous growth replaced by smooth scar tissue. Dr. Dodd later operated on this case and corrected the marked ectropion.

CASE IV. Practice of Dr. J. Nevins Hyde, Chicago. Farmer, age 33, came for treatment in December, 1899. An eruption began two years before and involved many internal and external organs, including the *left lower lid, temple and cheek*.

CASE V. Practice of Drs. W. L. Noble and F. H. Mont-

gomery, Chicago. Mrs. A. W., aged 28. Disease appeared twenty months before examination and had affected the tissues *about the right orbit*, including the cheek and forehead. The process had thence spread over the bridge of the nose and had involved the *left upper eyelid* and a small spot below the eye.

CASE VI. Practice of Dr. W. A. Pusey, Chicago. "I have under treatment at present (May, 1903) one case of *blastomycetic dermatitis involving the lower eyelid*, which is a typical beginning case, and in which the diagnosis is fully established



Fig. 6. Colony from plate-culture (X 320) of organism in blastomycosis. Hyde-Montgomery Laboratory.

Under small doses of potassium iodide three times daily, and with x-ray exposures to the point of producing an erythema. the disease has almost but not quite disappeared. There seems every reason to believe that a completely satisfactory result will be obtained. The patient has had only small doses of potassium iodide, ten grains three times daily, which is not sufficient to account for the very great improvement."

CASE VII. Practice of Dr. W. H. Wilder, Chicago. Dr. Wilder has kindly allowed me to copy a few notes from the

records of a case of facial blastomycosis in his service at the Illinois Eye and Ear Infirmary, more complete details of which it is his purpose to publish later. S. Y., aged 40, Lithuanian coal miner. Has lived in the State of Illinois nine years. Two years ago noticed a red spot on the right side of his forehead. This spread and involved the skin of the right temple, forehead, *right upper eyelid* and right cheek. There is no history of syphilis, congenital or acquired, or of tuberculosis on his own person or in his family. There is no disease like his, so far as he knows, in the locality (Bureau county) where he lives. At the present date *the blastomycetic process has not attacked the conjunctiva.*

CASE VIII. Practice of Dr. E. A. Fischkin, Chicago. This is another unpublished case* The paper (in which it is fully described) was kindly loaned me by Dr. Fischkin, and I have abstracted a few notes.

An Italian, age 51 years, has been in this country six years. History negative; wife and family healthy. Last May a pimple appeared near the external canthus. He scratched it with his finger, shortly after which it became sore, painful and began to enlarge. Subsequently a similiar lesion appeared on the back of the neck. The ocular growth, when first seen, covered an area three-fourths of an inch wide and one inch long, extending along the lower eyelid, encircling the external canthus and reaching the upper lid. It was elevated about a quarter of an inch above the plane of the normal skin and was covered by a thick, dark colored, adherent crust, on removing which a papillary growth was exposed. The growth at the external angle of the eye was ulcerated, the base of the ulcer being covered with thick pus. The margins of the growth had an abrupt slope, and on close inspection were found to be pierced by numerous miliary abscesses. The usual histological and bacteriological examinations showed the tumor to be a blastomycetic dermatitis.

A study of this rather rare and curious disease reveals the following characteristic:

The *fungus cells* are most numerous in the abscesses of the epthelial tissue and corium, although they are also found in more superficial pus collections, as well as between

* *Demonstrated at the clinical meeting of the Chicago Medical Society, Nov. 4, 1903.

the cells of the rete and in the granulation tissue of the corium.

Dr. Howard F. Ricketts, who has published a most exhaustive report on this subject and has carefully examined, clinically and otherwise, many of the cases that have appeared in Chicago, concludes that "the so-called *protozoic disease* of Wernicke and others; Busse's and Curtis' *sacchar-*



Fig. 7. Blastomycosis of left lower lid. Dr. Fischkin's case.

omycosis hominis and Gilchrist's *blastomycetic dermatitis* are various manifestations of the same disease. The organisms isolated from various cases differ in minor respects among themselves, but are so closely related morphologically and biologically as to justify their inclusion in a common genus, *Oidium*. Of these there are three morphological types; (a) blastomycetoid, or yeast-like; (b) oidium-like; (c) hypomycetoid. There are two histological forms of the disease in the skin, the eosin-ophilous and the non-eosinophilous, the

former being associated with the mould type of the organism. Hence *oidiomycosis cutis* is the term that best indicates the true nature of the disease. Aside from the infections considered, certain cases described in literature point to oidium-like organisms that may cause other severe pathological conditions in man."

Sites of the Infection. Any part of the skin surface may be infected by this disease. As the *palpebral skin* was affected in at least nine known instances—my own case and eight others referred to—I believe we may assume that the lid skin is involved in about 25 per cent. of all cases. *In all these the conjunctiva resisted the advance of the growth.* Indeed, in two cases only can I find a history of a mucous membrane being infected by a *blastomycosis*.

Method of infection. As in similar processes we probably always have a traumatism sufficient to remove the protecting epithelium, with a subsequent implantation of the oidium spores. It is easy to predicate such an origin in palpebral blastomycosis, because it is a common habit to rub and scratch the lid edges, especially when, as in Chicago, they are constantly irritated by wind and dust—conditions favorable to the production of a mild degree of blepharitis and the itching that accompanies it. Once established as a small reddish pimple, the disease gradually but steadily creeps over the skin. This papule soon becomes a pustule which, in its turn, is transformed into a tumor with a rounded, elevated, reddened base, the whole surrounded by a reddish areola. In five or six months the tumor acquires a diameter of a couple of inches, with an irregular, wart-like surface that secretes a glairy, whitish pus.

There is very little pain in the facial lesions; the discomfort experienced by ophthalmic patients is mostly due to secondary infections of the tumor or of the conjunctiva.

Prognosis. This is always good, As Ricketts points out, of 26 cases of dermal blastomycosis tabulated by him, only one resulted in general invasion and death. He believes that there is a "protozoic" form of the disease, usually "primary in the lungs, where extension is much easier than in the skin, metastases occur with greater ease and general toxic disturbances are more easily produced."

Diagnosis. *These tumors in some respects resemble carcinoma, tuberculosis and epithelioma of the skin.* Although

no patients are free from the signs and symptoms of syphilis, it is quite possible that a blastomycetic tumor might also be mistaken for a syphiloderm. However, the comparatively rapid progress of a blastomycosis, its soft spongy walls and marked areola, the discharge of a tenacious muco-pus from minute openings on its surface, the complete absence of glandular involvement—all these serve to distinguish it from any of the tumors just mentioned. Finally, an immediate diagnosis may be made by examining the pus from the "miliary" abscesses, or a piece of tissue from the tumor itself.

Treatment. Where it can easily be accomplished, excision of the tumor or thorough curetting under an anesthetic, is the best practice. This may be followed, as in my own case, by the use of the x-rays, and the administration of potassic iodide, in doses increased, if necessary, to 150 grains three times daily. For the last named remedy we are indebted to Dr. A. D. Bevan, who first observed, and to Drs. Nevins Hyde and F. H. Montgomery, who have repeatedly substantiated the fact that the iodides are almost a specific in blastomycetic dermatitis. Several cases under their care recovered entirely without surgical intervention. When operation is refused the exhibition of potassium or sodium iodide should be continued for the three or four months required for a cure. *Local applications* are not of much use. Hot bichloride solutions, with or without boric acid, may be used for cleansing purposes. I found the one-per cent. ichthyol ointment in lanolin of some value.

Clinical History and Appearances. The story as told by the patient and the appearances observed by the surgeons in these cases of blastomycosis of the eye are distinctly uniform. Ricketts briefly summarizes them as follows:

1. An incipient papule which becomes pustular, yielding a glairy, somewhat tenacious pus.
2. Gradual extension of the ulcerating surface, which is soon covered with coarse, soft and pliable papillae, and is surrounded by a reddened areola in which many abscesses are visible.
3. Cicatricial healing in the oldest portions of the lesion as the border advances.
4. A variable amount of pain, depending on the site involved, or upon a temporary increase or decrease of the virulence of the specific infection present.

5. The absence of glandular involvement in a great majority of cases.

6. The protracted and progressive course of the disease, which may extend for years and cause great cicatricial deformity.

7. Periods of rapid extension, interrupted by periods of relative quiet.

8. The tendency of the scar to eventually approach the appearance of normal skin.

9. The upper extremities (hand and forearm) and the face (eyelids) are most frequently attacked, although no portion of the skin is proof against invasion.

10. Extension to mucous surfaces does not readily occur.

11. The absence of general toxic disturbances, attributable to the local infection.

I wish to acknowledge my indebtedness to Drs. J. Nevins Hyde, W. A. Pusey, F. H. Montgomery, Ludwig Hektoen and Howard T. Ricketts—all of Chicago—for their kind and valuable assistance in preparing this paper and for permission to use reports of cases, photographs and drawings, published by them.

For further information regarding the cases described the reader is referred to the following articles and monographs:

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ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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PHILADELPHIA, PA.

Lasting Results of Iridectomy in Primary Glaucoma.

WYGODSKI, G., St. Petersburg. (*Klin. Monatsbl. f. Augenh.*, 1903, p. 177.) W. publishes the results of iridectomy in three hundred and fourteen cases of glaucoma of his own observation, of which 37 were acute inflammatory, 147 chronic inflammatory, 129 simple glaucoma, observed two years after the operation, 81 per cent. of acute inflammatory were favorable, i. e., 76 per cent. showed improvement, 5 per cent. status idem. 11 per cent. impairment, 8 per cent. amaurosis. Chronic inflammatory glaucoma resulted in 10 per cent. improvement, 40 per cent. status idem, 30 per cent. impairment, 20 per cent. amaurosis. Out of 104 cases of typical glaucoma simplex, 0.96 per cent. showed improvement, 10.5 per cent. status idem, 52 per cent. impairment 36.5 per cent. amaurosis, and of 25 cases of simple glaucoma with intermittent inflammation: 0 improvement, 32 per cent. status idem, 36 per cent. impairment, 32 per cent. amaurosis. In all 129 cases of glaucoma simplex only 15.5 per cent. yielded favorable results. How great a difference was between immediate and lasting results is illustrated by W.'s statistics on the immediate results in 458 cases: acute inflammatory glaucoma 100 per cent., chronic inflammatory 94 per cent., glaucoma simplex 90 per cent.

In all kinds of glaucoma the prognosis is better the earlier the operation is performed; best in the prodromal stage, where no anatomical changes have taken place. On appearance of the first symptom of a relapse a secondary operation, either sclerotomy or iridectomy must be done.

Miotics are valuable adjuvants but insufficient as remedies.

New Forms of My Eye Magnets.

VOLKMANN, W., Berlin. (*Ibid.* p. 217.) V. describes new forms of his magnets with a table of their power at varying distances. The details must be read in the original.

Lattice-Shaped Opacities of the Cornea After Injuries.

CASPAR, L., Mülheim. (*Ibid.*, p. 289.) C. calls attention to, so far not described, rectilinear, almost parallel or crossed grey opacities of different lengths of the central portions of the cornea after various, mostly severe, injuries always combined with contusions, sometimes with abrasions or perforations at the sclero-corneal junction. They are situated underneath the epithelium, which remains smooth, but, where the lines show nodules, they may be stained with fluoresceine. They never occur before the first week, and disappear entirely after six or eight weeks, never leading to ulceration. The affection is probably caused by a laceration and loosening of the anterior strata of the cornea, giving rise to formation of cavities in which cellular exudation takes place. Vision is transiently impaired through the opacities even after the direct sequelae of the injury may have subsided. Three cases are reported.

On the Methods of Treatment of Serpent Ulcer of the Cornea, Especially Those Practiced at the Eye Clinic of Bonn.

HERMANN, J. (*ibid.*, p. 429.) Hermann gives a review of the different methods of treatment of serpent ulcer. If a small ulcer shows no tendency to invade healthy tissue and the hypopyon is of no account, it is treated at Bonn with atropine, frequent antiseptic irrigations and moist heat. Dressings, powders, salves, subconjunctival injections, cauterizations of the upper fornix, injections into the anterior chamber or scraping with sharp spoon are not employed. If the ulcer is further advanced, the hypopyon large, and if progressing toward the center, the treatment is operative, either

by thermocautery or keratotomy, according to Saemisch Hermann shows how the latter method is the more preferable and has given, at the clinic at Bonn, excellent results, provided it is not practiced as a last resort, but in time. Affections of the tear sac are treated by frequent irrigations with oxycyanate of mercury 1: 5000, without any operative interference as long as the ulcer exists.

The Fundamental Principles in Combating Trachoma.

VON GROSS, Emil, Prof., Commissioner for Trachoma matters. (*Orvosi Hetilap, Szeweszet*, 1903, No. 3.) Von Gross discusses the principles according to which he formulates his trachoma reports to the internal office of the Government by which he was appointed superintendent over trachoma matters in Hungary. They are: 1. Every case of trachoma must be reported under penalty of the law. Controlling examination in schools, factories, etc. 2. Gratuitous ambulant treatment by local physicians with corresponding permanent salary. Special trachoma courses for medical students and the attending physicians. 3. Improvement of hygienic conditions; providing for the families whose supporters are affected with trachoma. 4. Combination and simplification of the numerous regulations with regard to trachoma. 5. Offering rewards for scientific researches promoting our knowledge of the pathology and therapy of trachoma, and gratuitous distributions of brief popular instructions among the people.

Prof. Richard Foerster's Merits in General and Ocular Hygiene.

COHN, H., Prof., Breslau. (*Allg. Med. Central-Zeitung* 1902, No. 89.) Cohn commemorated, in the hygienic section of the Silesian Society of Patriotic Culture, the merits of the late Prof. Foerster with regard to cholera, drinking water, dead houses, isolation hospitals, quackery, sanitation of Breslau and school hygiene, and especially on the hygiene of the eye; his investigations on tobacco amblyopia, nystagmus of miners, endemic follicular conjunctivitis, illumination of school rooms, utilization of prisms for improving the illumination, the recommendation of neutralizing glasses in myopia. Of Foerster's ophthalmological works Cohn mentions only his invention of the perimeter and his treatise on the relation of general diseases and ocular affections, to which, by his excellent general medical education, Foerster was especially well qualified.

On the Print of the School Books, Used at Breslau, from an Ophthalmological Standpoint.

COHN, H. (*ibidem*, 1902, No. 41). Cohn tested the school books with the line counter. The latter consists of a card with a hole, 1 cm. square. If more than two lines of print can be seen through this hole the print is bad. Thus only 13 books, used in the schools of Breslau, were found to have good print, while 21 were very bad, 16 partly bad. The school board at Berlin adopted Cohn's propositions to admit only books corresponding to the typographic size, recommended by Cohn.

The Eyes of the Medical Students at Breslau.

COHN, H., Prof., Breslau. (*Zeitschrift f. Schulgesundheitspflege*, 1902). Cohn examined 410 students in 1866, 108 in 1888 and 138 in 1902, and, each time, found in 60 per cent. myopia and an average degree of 3.1 D. In 80 per cent. of the cases the right eye was more myopic, probably from being held closer to the paper in oblique handwriting. Cohn sees in these poor results a new incentive for paying strict attention to hygiene in the schools.

A Case of Hyaline Degeneration of the Conjunctiva.

GUTH, ERNST. From the eye clinic of Prof. E. Zirm, Olmütz. (*Centralblatt. fur Augenh.* Supplementheft, 1902, p. 386.) So far only 43 cases are published of which 31 occurred in Russia alone, 5 in adjoining countries, 5 in Germany, 2 in Italy. G. reports this case, since as yet none have been communicated from Austria. The posterior surface of the right lower lid shows, on eversion, a yellowish red ridge, 5-8 mm. thick, smooth in its nasal half, but rough by deep furrows in the temporal half, and the fornix a broad fold, bulging as far as the center of the cornea, which looked as if petrified, while the margins were transparent and reddish grey. On the upper lid these exuberances extend only over the nasal half of the tarsal conjunctiva, the temporal half being velvety, slightly thickened, opaque red, without signs of shrinkage or cicatrization. The ocular conjunctiva, as far as 1 cm. from the lower and inner, and a little more from the remaining borders is perfectly unaltered. The semilunar fold is converted into a yellow ridge, next to which the caruncle is indistinctly noticeable. The cornea is perfectly

smooth. The left eye shows similar conditions. There was no history of trachoma. The excrescences were extirpated and the disfigurement entirely removed. Sections of the hardened material showed that it consisted of hyaline degeneration of the walls of the arteries and capillaries, while the surrounding tissue contained a profuse proliferation of cells. On some places the walls of the vessels looked as if they were casts of this substance. Staining according to various methods proved the characteristic reaction of hyaline degeneration. Nothing could be ascertained as to etiology and pathology of the affection.

A Case of Typical Bilateral Kryptophthalmus.

GOLDZIEHER, W., Budapest. (*Centralbl. f. Augenh.*, 1903, p. 225.) So far only 10 cases of K. in man are published. G. reports another one, occurring in a girl of 10 years. The skin passes, without interruption from the forehead to the cheek, and, through it, a movable ball of the size of a cherry, apparently the rudimentary globe, can be felt. The child can weep, which has so far not been observed in Kryptophthalmus. The covering skin then gradually bulges forward, until fluid runs from the nose, which proves the existence of a lacrimal gland and duct. For the explanation of Kryptophthalmus G. assumes an ulcerating process of the surface of the eyeball at the time of formation of the conjunctival tract, leading to a large defect and adherence of the wound surface to the covering skin from which, under normal conditions, the lids would develop but cannot on account of the destruction of the conjunctiva. This would explain the ablephary and the indifferent structure of the skin covering the kryptophthalmus.

On Traumatic Serous Cysts of the Iris.

AHLSTROM, G., Gothenburg. (*Ibidem.*, p. 257.) Two and a half years after an injury of the iris by a piece of iron, which had been extracted with Hirschberg's magnet, two cysts were observed on the place of injury. Not all cysts of the iris have the same origin, and A. discusses the different theories, advanced for their explanation. For his case he adopts the opinion of Rothmund, viz: that by the perforating injury, epithelia of the cornea are conveyed to the anterior surface of the iris from which, by proliferation, the cysts

are formed. Histologically the cysts consisted of iris stroma, lined in the interior with pavement epithelium, and contained coagula of mucus.

On Living Leeches in the Conjunctival Sac of the Human Eye.

KUWAHARA, Y., Nigata, Japan. (*Ibid.*, p. 362.) K. reports a case of trachoma in which a Japanese leech 2.7cm. long, was found near the temporal angle with its sucker attached to the upper fornix, without causing any inconvenience; and another one in which the leech was found near the lower fornix. The conjunctiva was very much inflamed and showed several scars.

Congenital Wordblindness.

WERNICKE, Buenos-Ayres. (*Ibidem*, p. 264.) A girl, aged 19, and a boy, aged 10 years, with normal intelligence and vision, could not, in spite of all efforts, learn to read letters well, while numbers were read correctly and rapidly. So far only 11 such cases are described, but the etiology is not known. The treatment consists in several short reading lessons a day. If no progress is noticeable the general instruction must be oral.

Gunshot Injuries of Both Eyes.

STEINDORFF, C. (*Ibidem*, p. 267.) A shot with a revolver into the left temple, 4 mm., behind the external canthus with V. L. = O. V. R. = fingers externally at 30 cm., apparently lacerated both optic nerves. Ophthalmoscope showed optic atrophy, hemorrhages, extensive rupture of chorioid and retina with new formation of connective tissue. The ophthalmoscopic conditions are illustrated.

On Wearing Prothesis.

AHLSTROEM, G., Gottenburg. (*Ibid.* p. 289.) To avoid the formation of the well known deep furrow of the upper lid after enucleation the prothesis must have a substantial support. Ahlstroem recommends for that purpose hollow glass globes of 10 to 15 mm. diameter before which the artificial eyes are placed in the usual manner. These orbital balls are manufactured by Müller Sons in Wiesbaden.

Contributions to the Magnet Operation.

FEHR, Assistant at Hirshberg's clinic. (*Ibid.*, p. 291). A piece of iron 0.2: 0.8: 1.25 mm., weighing 0.001, could not be extracted from the vitreous by any kind of magnet before the 17th day after injury and the 11th attempt at extraction, since, on account of its minute mass and being imbedded in blood coagula, the resistance was too great in proportion to its power at maximal magnetization. The point was to gradually disentangle it from the adherent coagula by frequent attempts at extraction, and the result shows that scleral section must not too readily be resorted to, provided that the foreign body is aseptic and the eye without irritation.

Contributions to the Symptomatology and Treatment of Exophthalmic Goitre.

Voss, G., St. Petersburg. (*D. M. Woch.* 1903, No. 33). Voss reports 2 cases with unusual complications, viz: in the first, ophthalmoplegia exterior (paralysis of right superior and external, left inferior and external recti), in the second choreic tremor. He warns against iodine as he saw the first symptoms of the disease develop after energetic applications of iodine on a small goitre that had existed for years. His favorite remedy is bromine.

On the Frequency of Visual Disturbances in Women Teachers.

WICHMANN, R., Harzburg. (*D. M. Woch.* 1903, No. 35.) Out of 780 women teachers 328, i. e., 42 per cent. wore glasses. 240 (30 per cent.) were perfectly healthy, 540 (69 per cent.) had been, or were still, sick. Of the 240 healthy teachers 85 (35 per cent. wore glasses, of the 540, who were, or had been sick, 243 (45 per cent.) wore glasses. From this W. infers an unfavorable influence of general affections on the eyes.

Three Cases of Recovery of Detachment of the Retina.

HERSCHEL, Hamburg. (*D. M. Woch.*, 1903, No. 37, V. B.) Herschel contradicts the assertion of Deutschmann, that only one-half per cent. of the cases, not treated according to Deutschmann's method, were cured, by healing of 9 of his 32 cases, i. e., 28.1 per cent., of which he demonstrated 3. In none an operation was performed. On the other hand,

he saw 3 cases which had been operated on, according to Deutschmann's method, and had become blind. Their eyes were soft, and total cataracts had developed.

On the Relation of Scrophulosis to the Most Frequent Conjunctival and Corneal Affections in Childhood.

SPRENGER, TH., (*Inaug. Diss. Giessen*, 1902.) Sprenger examined 1692 cases, *i. e.*, 17.68 per cent. of all eye patients, treated at the eye clinic at Giessen from 1890 to 1901, to what extent, in so-called scrophulous ophthalmia, symptoms of scrophulosis could be found in the patients up to the 20th year. Eight hundred and one cases (47.39 per cent.) presented symptoms of scrophulosis, *viz.*: Eczema 34.30 per cent., rhinitis 10.24 per cent., swelling of glands 24.22 per cent., eczema and rhinitis 19.74 per cent., eczema and glands 5.49 per cent., eczema, rhinitis and glands 2.99 per cent.

Marked tuberculous affections occurred in 33 cases (1.95 per cent.), pediculi capitis in 64 cases (3.78 per cent.). The cornea was diseased in 1140 cases, *i. e.*, 67.33 per cent., conjunctiva 5.73 per cent., lids 2.01 per cent., lids and conjunctiva 2.90 per cent., lids and cornea 9.63 per cent., lids, conjunctiva and cornea 5.32 per cent., conjunctiva and cornea 7.03 per cent. Of the above mentioned 1140 cases of isolated affections of the cornea 284=24.9 per cent. had multiple ocular affections, 856=75.1 per cent. a simple one. The latter were: Pannus 22.20 per cent., indefinite keratitis 5.88 per cent., fascicular keratitis 5.00 per cent., infiltration 25.61 per cent., phlyctenules 10.44 per cent., ulcers 5.97 per cent. If those cases, in which other etiological factors, as tuberculosis, infectious diseases, pediculi capitis were found, are added to the 47.34 per cent. of scrophulosis, there remain 45.28 per cent. in which scrophulosis could not be ascertained. Therefore, Sprenger agrees with Axenfeld and Uthoff that the phlyctenular eczematous affections of the cornea and conjunctiva cannot unconditionally be considered as symptoms of scrophulosis.

Hemorrhages Into the Vitreous in Sclerosis of the Retinal Bloodvessels.

WIRTH, OTTO. (*Inaug. Dissect.*, Giessen, 1903.) W. reports 3 cases observed at the Clinic of Giessen, during the last two years. In the first there was a preretinal hemor-

rhage with a convex, instead of a straight, as usually, upper border. In the other the hemorrhages were diffuse, and the blood formed lumps in the vitreous. All ended with recovery, but deterioration of vision.

Temporary Resection of the Lateral Orbital Wall, According to Kroenlein.

LINDNER, HERMAN, Giessen. (*Inaug. Dissert.*, 1902.) L. describes the method of Krönlein and its modifications with a short review of the cases, operated on since 1900, from literature. Two cases from the Eye Clinic at Giessen are reported in detail, which exhibited the symptoms of a slowly, but steadily, growing retrobulbar tumor. At the operation no tumor was found, but the exophthalmus partially subsided. Since the operation is not connected with any danger for the life or eye of the patient it is permissible even in doubtful cases, for diagnostic purposes.

Contributions to the Pathogeny and Treatment of Glaucoma.

ZIMMERMANN, W. (*Beitraege zur Augenheilkunde*, 1903. Heft, 58.) Although most theories of glaucoma, of which Z. gives a review, lack sufficient proof and even the accepted hypotheses of retention and hypersecretion are still the subject of controversies, there are, no doubt, some well established truths in them. But one question, viz: the "primum nocens" is still to be solved. Therefore the author very elaborately collected from literature the results of anatomopathological investigations and clinical examinations, to construe, as he expresses it, the mechanism of glaucoma. His conclusions are:

1. The prodromal glaucoma is not a disease proper of the visual organ, but a product of a disturbance of circulation and the mechanical expression of a difference between general arterial blood pressure and intraocular tension. The latter may remain normal for a long time, as long as a slight decrease of pressure in arterial circulation exists, as in some forms of chronic simple glaucoma.

2. The prodromal glaucoma becomes an ocular disease by repetition or continuance of the local mechanical changes of the eye, by which disturbances of nutrition and inflammatory alterations of the bloodvessels, and finally also the tissues of the eye, may be created.

3. These detrimental causes being established, the glaucoma becomes stationary and slighter differences between ocular and blood pressure may suffice to evoke the single attacks. The same may be brought on by mydriatics.

4. Thus there is really only one kind of genuine glaucoma, the different clinical forms are only expressions of the various factors necessary to elicit glaucoma.

5. Also the divers forms of secondary glaucoma may be unfavorably influenced by the same causes as genuine glaucoma.

6. The treatment must strive to remove the disturbance of circulation. For this the author recommends strophantus and, for longer use, adonis vernalis, which may also be given as prophylactics. Operations must be resorted to in all cases in which the somatic detrimental causes cannot be lastingly eliminated. The clinical histories of nine cases are reported for illustration.

Blepharitis.

WOLFFBERG, Breslau (*Wochenschrift für Therap. und Hyg. des Auges*, VII, No. 1), has found benzine and peroxide of hydrogen two efficient agents in the treatment of Blepharitis. The former is applied on cotton pledgets. The lids are firmly closed and the margins ectropionized when the benzine is thoroughly rubbed into the base of the lashes. The peroxide may be dropped upon the lashes and has the advantage that it renders visible the crusts which are at times so intimately fastened to the ciliary margin as to be otherwise unperceptible. After the cleansing, yellow salve is to be rubbed in, and if the case be stubborn, it is also applied to gauze and allowed to remain on lids over night.

Histologic Changes in Trachoma.

RAEHLMANN, Weimar (*Die Ophthalmologische Klinik*, VII, No. 19), states that while the generally accepted view is, that the follicle is the essential element in trachoma and that all other changes are sequelae, no unanimity exists as to relation and sequence. His own observations show that the follicle undergoes a series of metamorphosis. In mild cases of trachoma the follicle may be absorbed, leaving no traces; that more frequently it is converted into cicatricial tissue, and that very frequently through ulceration, exfolia-

tion of its surface and expulsion of its contents, extensive tissue defects are occasioned which are not limited to the epithelium, but may extend deep into the submucosa. As the result of pathologico-anatomic examinations of excised conjunctiva and of the entire lid, R. is convinced that the epithelial plugs and exfoliations, and in part, also the new formed glands are related in a causative way with the follicular ulcerations.

Phlegmon of the Lids with Gangrene of the Conjunctiva, Due to the Staphylococcus; General Sepsis; Death.

ZIA. (*Die Ophthalmologische Klinik*, VII, No. 20.) The affection occurred in a child 5 years old. It began with swelling of the lids and of the lip, and was attributed, by the parents, to a sting. In the course of a few days the thyroid gland became swollen and a thick membrane appeared on the inner surface of the lips. On the right side the lids were greatly swollen and indurated, and beneath the skin of the upper lid a collection of pus was present. The conjunctiva was everywhere chemotic and contained numerous ecchymoses. All these symptoms increased in gravity, and the conjunctiva became gangrenous. On the left side there was only a muco-purulent discharge.

A large quantity of pus was discharged through an incision made into the lid and through a spontaneous opening in the conjunctiva. Death resulted from meningitis. The bacterial findings were staphylococcus pyogenus aureus in the secretion from both eyes.

Injury to the Eye Muscles.

FEJER, Budapest (*Archive für Augenheilkunde*, September, 1903), has seen an instance of severing of the ocular muscles in a boy 7 years of age. A study of the false images determined the existence of a palsy of the internus and a doubtful palsy of the inferior oblique. The diplopia disappeared with healing of the wound. The author doubts the advisability of attempting to suture the severed muscle at the time of the injury, preferring to await the outcome. If the paralysis proves permanent, it can be corrected by operation.

A Form of Nystagmus Appearing upon Diversion of the Attention.

BARTELS, Marburg (*Ophth. Klinik*, VII, No 20), observed

this form of nystagmus in a 32 year old man, whose eyes were otherwise normal, but who had suffered from inflammation of the ear in childhood. The movements which were at times present were horizontal and were increased during unconstrained conversation, and disappeared upon fixation or lateral deviations of the eyes. There were present slight tremor of the tongue and of the hand. In closing the eyes, fibrillary contractions occurred in both orbicular muscles. The author is at loss for an explanation of the cause, unless the otitis could have been the starting point,

Traumatic Enophthalmus.

LUNIEWSKI, STEFAN, Kolomea (*Die Ophth. Klinik*, VII, No. 18), records two cases of traumatic enophthalmus. From a study of these and other cases, he believes that the origin of enophthalmus should be considered under two secondary causes: mechanic and nervous. In the first class he includes all cases in which, as the result of the trauma, the orbital cavity has been increased or its contents diminished in size. The second class is best explained by the hypothesis of A. Maklakow, which assumes a peripheral injury to the sympathetic nerve, at a point close behind the ciliary ganglion where the ophthalmic artery is surrounded: above by the superior branch of the oculomotor, below and to the outside by the sympathetic and the abducens, and below by the inferior branch of the oculomotor with its branches for the ciliary ganglion. Just below this point courses the nasociliary branch of the ophthalmic branch of the trigeminus. As a result of the injury, the central artery is torn and blood is extravasated, pressing upon and squeezing the nerves at this position. According to the author, the more acceptable view is, that in consequence of the injury in the vicinity of the eye, there occurs a very severe concussion of the entire orbital contents, resulting in a tearing and squeezing of the nerve fibers behind the eyeball and in a concussion of the ciliary ganglion, together with numerous small blood vessels. The lesion may be increased by indirect pressure which would result from hemorrhages in the nerve sheath and in the c. ganglion. The severity of the symptoms accompanying the enophthalmus would be dependent upon the degree of the injury at this point,

A Contribution to the Anatomy of the Lacrimal Apparatus.

HALBEN, Greefewald (*Von Graefe's Arch. F. Ophthal.*

LVII—1 Heft), from a serial study of normal and pathological specimens, the following conclusions were arrived at:

The canaliculus begins as a small vertical funnel, starting from the punctum and increasing in width until it reaches the horizontal section of the canaliculus 1-1/2 mm. deep, at which point it has a width of 1-1/2 to 2 mm. the greatest width the canaliculus obtains. From this point on the canaliculi course in a nearly horizontal direction as a smooth vertical fissure to their mouths within the sac, which, in the ideal form a papillary elevation containing two horizontal superimposed slit-like openings.

In its entire extent, from the punctum to the beginning of the nasal canal, the passage is enveloped in firm elastic fibers which are most numerous and thick about the punctum, but are everywhere in considerable quantity. The periosteal wall of the sac and that portion of the anterior wall of the sac extending from the lid to the entrance into the bony canal are only less markedly protected by elastic tissue. In the walls of the canaliculi the elastic elements of the basal membrane are interwoven in longitudinal, circular and radiating manner. From the superior and inferior surfaces numerous strong elastic bands are woven within the longitudinal coursing muscle which surrounds the canaliculi. It is by means of these radiating fibers through contraction of the aforementioned muscle starting from the point of fixation to the nasal side, that the lumen of the canaliculus can be converted into an oval. Schrimmer's experiments prove that this actually occurs. An inherent movement in the canaliculi was demonstrated by the appearance in the wound made in extirpation of the lacrimal sac of a solution introduced into the conjunctival sac. The elastic bands penetrate and interlace the walls of the sac in all the directions.

The significance of this richness in elastic tissue lies mechanically in the security afforded by a greater and more easily obtained ductility and shifting of the point of origin of active or passive dilatation, and chemically in the greater protection in virtue of its resistance, not only against acids and alkalies, but also against pepsins, bacterial toxins, and other proteolytic agents.

It also secures against the spread of inflammation from within, outward and vice versa. The resistance offered by bloodvessels to the action of these agents can also be attrib-

uted to the elastic coat, as there is no other substance from an anatomic standpoint to which this resistance can be attributed.

The puncta are surrounded by muscular fibers of considerable combined strength forming a quadrangular sphincter. This, by nature of its cylindric prolongations to the extent of about 1 mm. along the vertical section of the canaliculus, is well adapted to securing narrowing, or even occlusion of the puncta.

The canaliculi are characterized by a highly developed pavement epithelium, the above described elastic coat, an enveloping longitudinal muscular layer, and the absence of a submucosa. The walls of the tear sac have a two or more fold layer of cylindric epithelium, which is separated from the above described elastic coat by a more or less rich adenoid tissue, which is also traversed by fine elastic fibers.

These relations were observed without marked differences, irrespective of age. It may be asserted that this elastic tissue is already fully developed in early youth, only it is not so coarse nor compact. These findings agree with what is known of the development of elastic tissue in other organs.

The Treatment of Hypopyon-Keratitis with the Sera of Tizzoni-Panichi and Romer.

CALDERARO, Siena (*Wochenschrift für Therap. und Hygiene des Auges*, VII, No. 2.), has treated 35 cases of hypopyon-keratitis in different stages of the affection with the sera of the above mentioned investigators. The method of procedure was first to wash out the conjunctival sac with a solution of bichloride of mercury 1:1000 to prevent reinfection by organisms not affected by the specific. One-half of a hypodermatic syringe of the serum was injected beneath the conjunctiva every day, according to the severity of the symptoms, and every two hours the serum was instilled into the conjunctival sac. In severe cases subcutaneous injections were made into the loins and thighs. The results obtained have led him to the following conclusions:

(1) That the use of antipneumococci serum is indicated, and very efficacious in the treatment of hypopyon-keratitis. In the beginning of the disease two subconjunctival injections and conjunctival instillations every two hours is sufficient.

(2) That in cases far advanced the galvano-cautery and

paracentesis cannot be dispensed with. The injections must be made every other day and the instillations every two hours.

(3) When the ulcer shows an inclination to become reinfiltrated (from the presence of pyogenic organisms) instillation of a five per cent. solution of collargol or methyl blue 1:100 three times daily must be added.

(4) The serum of Tizzoni is to be preferred, not only owing to its greater activity, but because it can be preserved as a dry powder, which is readily soluble in water.

Primary Atrophy of the Chorioid with Sclerosis of the Vessels.
(*Atrophia Alba Chorioideae.*)

CUPERUS, ZWALLE, Holland. (*Arch. f. Augenheil.* September, 1903.) The author's case of this rare affection occurred in a man 70 years of age, of good health and habits, in whose relatives several instances of blindness, coming on gradually and at the same age, occurred. The patient's sight had been failing 40 years and was reduced to counting fingers. The visual fields contained large central scotoma with poor peripheral color sense, but normal form boundary. Surrounding the papilla and extending into the macula the fundus had a striking white appearance, shading off in the periphery from a light brown into a darker color. In the extreme ophthalmoscopic field conditions were normal. At the posterior pole of the eye the chorio-capillaries were chalk white and were empty; more anteriorly they were bright red with areas in which they were rose colored. At the equator larger vessels, probably of the middle coat, could be observed as rose-colored loops. Black specks were scattered throughout the retina, especially near the retinal vessels. The papilla was light gray and was excavated over its entire surface to the depth of 3 D. The arteries were diminished in size and the finer ones had entirely disappeared. According to Cuperus, the case differed from all previously reported in the following points—the intense involvement of an area extending from the disc to the macula with a simultaneous reduction of central vision, due to a central scotoma and by the complete absence of hemeralopia.

New-Formed Optico-Ciliary Veins.

VAN GUENS, Haag (*Arch für Augenheilkunde*, September,

1903), has seen optico-ciliary veins form in a case of optic neuritis, in the course of three months' time. Notwithstanding the long continuance of the choked disc, vision remained almost constantly normal. Eighteen months later, the new formed vessels had disappeared. Van Guens considers that this case confirmed the theory of Vassius et al, that in cases of choked disc new anastomoses are formed through the optico-ciliary veins with the chorioidal veins. He believes the retention of good vision was due to the presence of these vessels.

Anatomical and Clinical Description of a Case of Reattachment of the Retina.

UHTHOFF, W., Breslau (*Die Ophth. Klinik.*, VII., No. 19), has had the exceptional opportunity of studying anatomically, after death, the eye of a patient suffering from chronic nephritis, albuminuric retinitis [and detachment of the retina, in which the retina had become reattached after drainage, by canula, of the skin of the leg. In portions of the fundus the retina had simply fallen back into place, and here the layer of rods and cones was retained, but not in an entirely normal condition—certainly the retina had during life in part resumed its function. In other parts between the chorioid and retina organized exudate was present, which entirely united the two and had led to circumscribed folding of the outer layers of the retina. This exudate contained long connective tissue fibers and also circumscribed pigment heaps.

The author considers the relation of these changes to the white subretinal bands, which are so often present in cases of reattached retina. The retinal pigment layer was for the most part well retained.

Uththoff has seen 34 cases of permanent reattachment of the retina (about 8 per cent. of recoveries). In the discussion, following the reading of U.'s paper, Elschnig stated that he had examined the eyes of 200 cases with nephritis. In 10 per cent. of the cases with retinitis there was associated detachment of the retina. Deutschmann has frequently seen white streaks in floating retinae which persisted after reattachment. In his experience, the degeneration that occurs is very slight, and he has seen good vision after recovery delayed three years. This he explains by the fact

that at night (during recumbency) the retina often comes in contact with the chorioid, and thereby receives nourishment. This, likewise, explains the morning improvement in vision which is often met with. He has only twice observed spontaneous cure, whereas he has obtained 23 per cent. of recoveries in 174 cases operated upon. Of these only one was recent, as he believes that all other methods of treatment should first be tried. After recovery many of the cases at first showed no ophthalmoscopic changes, but later chorioid retinal disturbances were present, but it was impossible to connect them positively with the operation scar. V. Hippel, Jr., had severe hemorrhage follow operation, notwithstanding, considerable improvement in vision was obtained.

Müller considers the improved morning vision as an adaptation phenomenon. In a case operated upon 2 1/2 years ago, in which the retina is in place, the patient can always see somewhat in the mornings, but is blind for the rest of the day. Uhthoff, in closing, cautioned against the use of repeated sub-conjunctival injections of 10 to 20 per cent. salt solution, as they may lead to obliteration of Tenon's space, with the production of glaucomatous symptoms.

Retrobulbar Neuritis.

IOCHS' (*Die Ophth. Klinik*, VII, No. 20) case occurred in a healthy married woman, 38 years of age, who suffered from migraine. The symptoms were transient paralysis of all the extraocular muscles, intense headache, return of the paralysis with retrobulbar neuritis, which terminated in complete atrophy. No retrobulbar pain either spontaneous or upon pressure. According to the author, the only plausible explanation of the cause is a disease process at the apex of the orbit involving all the nerves which go through the superior orbital fissure and optic foramen. The escape of the intraocular muscles and the retention of normal calibre to the vessels are unexplained by this view.

Peribulbar Carcinoma.

REIS, Lemberg (*Arch. für Angenheilkunde*, September, 1903), performed exenteration of the orbit in a woman, aged 72 years, for peribulbar carcinoma. The tumor had the size of a hen's egg. Sagittal section of the removed mass divided the eyeball equatorially, the anterior portion of the

globe occupying the temporal part of the growth, the presumptions being that in the development of the tumor, the eye had been turned on its vertical axis. The tumor was an epithelial new formation, a carcinoma, which had sprung from the epithelium of the conjunctiva at the sclero-corneal margin.

The tumor was not merely epibulbar, but deserved the description of peribulbar tumor, as it completely surrounded the eyeball.

The globe was nowhere penetrated by the growth and there was no secondary carcinoma within the eyeball. The eyeball was in a stage of ordinary complete phthisis, caused by the pressure produced by the surrounding neoplasm and by the reactive inflammation.

The growth was attached to the nasal portion of the eye lids by means of small cell infiltrate (evidence of inflammation), but in no place did it penetrate deeper into the adenoid tissue. The mucosa of the lids showed numerous follicles and cysts, such as are also seen in other irritative conditions, such as chronic catarrh.

The Management of Myopia.

KUNN, Wien. (Abstracted from *Allgen, Wiener Med. Zeit*, 1903, No. 37 and 38, in *Wochenschrift für. Therap. u. Hyg. des Auges*, VII, No. 4.) From a study of the various theories held in reference to the causation of progressive myopia, Kunn lays down the following principles to be followed in the treatment of this affection: The diagnosis must be made as early as possible. Glasses previous to the age of 6 years, or the age of entering school, are to be deprecated as unnecessary and dangerous from possible accidents. After this age, however, they are imperatively demanded, as not only the ocular defect but the accompanying physical and psychical conditions retard the development of the child. When the degree of myopia has been carefully determined, the glass which fully corrects this error is to be prescribed for constant wear. It is very important during the first few years to re-examine the child three or four times a year, in order to detect any change which may have taken place. It matters not if after puberty, vanity impels a young lady to go without the glasses while upon the street.

A second group of cases is formed by persons who, when

first seen, have acquired myopic vision; these from their age and the degree of myopia refuse full correcting lenses, at least for near work, because of the brightness and apparent smallness of objects. In such cases brilliant results may be secured by at first giving for constant wear the glass which is comfortable for near work, and then each month increasing the strength of the glass 1. D. until the full correction is attained.

Corneal Astigmatism and Central Chorioiditis in Myopia.

SENN, Wyl. (*Arch. f. Augenheil.*, September, 1903.) A study of the relation of corneal astigmatism to central chorioiditis in myopia has led Senn to the conclusion that when a myopia is complicated by a degree of astigmatism with the rule of more than 2.5 D. the eye becomes affected by central chorioiditis before the refraction error has reached a degree of 18. D. On the other hand, when a myopia of 8. D. is associated with central chorioiditis, then, almost without exception, it is complicated by abnormal astigmatism, in the great majority of cases, with a high degree of astigmatism. He believes that the astigmatism acts as a causative factor, not only through reduction of visual acuity and the resulting vicious circle which favors the progress of the myopia, but that it, in conjunction with the stretching of the posterior pole occasioned by the nearsightedness, plays an inherent significant part in the etiology of the destructive fundus changes. That this part is so significant that it throws into the background all the other accepted predisposing causes (occupation, exhausting effect of disease, chlorosis, menstruation and climacteria in woman). This is illustrated by the fact that medium grades of myopia (to 12 D.) up to 30 years of age, almost without exception, are only affected with central chorioiditis when complicated by a corneal astigmatism of over 2 D. with the rule or an astigmatism against the rule.

The Cure of Peripheral Irritation of Motor and Sensory Nerves.

SCHLOSSER, Munchen. (*Die Ophth. Klinik*, VII, No. 19.) In eight cases of true convulsive tic, Schlösser employed injections of alcohol in the vicinity of the affected facial nerve or its branch. The technic consists in drawing

the ear forward and upward by its tip, so that the fossa in front of the mastoid process is exposed. A hypodermic needle is introduced at this position to the distance of 2 cm., and moved about until the styloid process is encountered. When this has been found the needle is pushed somewhat behind and deeper until the stylomastoid foramen is reached, when 2 cm. of alcohol is injected, and the effect watched. If there is no subsidence of the cramp, or if facial palsy does not appear, more is injected until a syringeful has been used. The best results follow when a paralysis of 1/2 to 1 hour's duration occurs. If necessary, the injection may be repeated in from 1 to 3 days. The results were good.

One case of reflex blepharospasm and eight cases of painful tic were treated with but one instance of relapse.

Emotional Glaucoma.

TROSSEAU, A. (*Die Ophth. Klinik.*, VII, No. 17), believes that in the search for anatomic causes of glaucoma, too little consideration has been given to the nervous origin of the affection occasioned by mental excitement, the clinical proofs of which are numerous. He cites an interesting case occurring in a 63 year old woman. Twenty minutes after the passage of a sound into the constricted lacrimal duct of an otherwise, presumably healthy eye, an acute attack of glaucoma came on. Consent to the probing had been reluctantly given.

Acoïn-Cocaine Anesthesia.

KRAUSS, Marburg (*Münch. Med. Woch.*, 1903, 34.), has employed this combination in the following proportions:

Acoïn, 0,025.

Cocaine, 0,05.

Sol. Nat. Chl. 0,75 per cent. ad 5.0.

The solution is injected into the skin at about four different points surrounding the site of the operation, using 0,2 ccm. at each place. The injection is followed by but little swelling, and anesthesia follows almost immediately. He has not observed any interference with healing. For enucleation of the eye, the injection is made into the orbit at the location of the attachment of the muscles. A hypodermic injection of morphine is given before operation to lessen

the pain of section of the optic nerve. He has used it successfully in operations upon the lid and lacrimal sac.

Roentgen and Radium Rays in Ocular Therapy.

DARIER, Paris (*Wochenschrift für Therap. u. Hyg. des Auges*, VI, No. 53), gives the results obtained with the above agents in the treatment of a variety of affections. The first was one of alveolar small celled sarcoma, in which the tumors were situated in the eyelids, conjunctiva, face and neck, with extension into the mediastinum as far as the heart. After ten treatments, of 10 minutes each, extending over a period of 15 days' time, all the facial tumors disappeared and the eyes could be opened normally. The mediastinal growths were undergoing absorption. In a case of specific chorioiditis with stubborn periorbital neuralgia, 24 hours application of radium gave complete relief. In a case of extensive traumatic hemorrhage into the vitreous, vision improved from one-tenth to one-third, with a corresponding clearing up of the vitreous after 24 hours' application. Two cases of retinal detachment and one of parenchymatous keratitis were unimproved.

A Disease of Dentists.

STANKOVIC, Belgrade. (*Zahnarztlicher Rewdschow*, XII, No. 584. Abstracted in *Wochensch. für Therap. u. Hyg. des Auges*, VII, No. 3.) Stankovic claims to have discovered in four-fifths of practicing dentists an affection of the right eye, characterized by divergence, diminished light sensibility of the retina, a scarcely detectable increased intraocular tension, and a lowered visual acuity. These disturbances are especially noticeable in dentists who work at gold fillings. In this class the amblyopia was more marked among those who were engaged in fillings requiring the constant use of the mirror. He describes the condition as a progressive (orthopaedic) amblyopia exanopsia resulting from the disuse of the affected eye; the right eye being less adapted for precision, owing to its position and the interposition of the nose. This occupational squint develops very gradually and was observed only in those who had been in practice at least ten years.

The Present Status of the Serum Therapy of Ulcus Serpens.

ROMER, Wurzburg (*Die Ophth. Klinik.*, VII, No. 19), gives

the results in 68 cases of *ulcus serpens* treated with serum. Twenty cases were seen in the early stage of infiltration, and all were cured with excellent vision; demonstrating the prophylactic value of the measure. Out of 48 cases in advanced stages of the disease, 80 per cent. were checked by the employment of the serum alone. It is especially deserving of use in these cases, as the resulting scar is less dense than that occurring after cauterization.

Traumatic Affections of the Cornea (Erosions, Keratitis Disciformis and *Ulcus Serpens*) and Their Relation to Herpes Corn

PETERS, Rostvek (*Von Graefe's Arch.f. Ophth.*, LVII. H. 1), as the result of a critical and also extensive clinical study, concludes that:

(1) In erosions of the cornea, whether after the original injury or a relapse, but especially after the repair of a relapse, disturbance of sensibility is the rule.

(2) That the erosive tendency of the epithelial layer is nothing more than vesication of a slight degree, due to edema which may simultaneously affect the deeper corneal layers, as in the well known striations occurring in the posterior surface of the cornea.

(3) That this edema, as with its analogue herpetic diseases, is of neurotic origin, which explains the persistence and, likewise, the continued recurrences of corneal erosions.

(4) That keratitis disciformis differs from erosions in the fact that the edema here injures the endothelial layer, and opacities form as a result of the penetration of the aqueous humor. The cloudy disc is on y exceptionally to be considered as the expression of an infection or as an abscess. Usually it partakes of the nature of a severe disturbance of nutrition resulting from a lesion of the nerves.

(5) In *ulcus serpens* a series of phenomena are present, indicating that the tissue changes found in erosions of the cornea and in the keratitis disciformis, and which are here also present, have an important influence upon the spread of the infection both superficial and deep.

(6) That no distinctive difference exists between herpetic affections and erosions, keratitis disciformis and *ulcus serpens*. A difference exists only in the fact that in the latter class the peripheral nerves are injured by trauma, whereas

in herpes an irritation (of a yet unknown nature) exists, which damages in a marked degree the peripheral nerve apparatus and the tissues innervated by them.

The Treatment of Purulent Ophthalmia by Concentrated Solutions of Permanganate of Potash.

VIAN, Toulon (*Die Ophth. Klinik*, VII, No. 17), reiterates his claims for the great value of concentrated solutions of potassium permanganate in the treatment of purulent ophthalmia. The conjunctiva of the everted lids is painted twice daily with a 1:10 solution of the salt, applied by means of cotton swabs. Where eversion is impossible, he sweeps the applicator between the lids and the globe. The resulting pain is mitigated by instilling a solution of cocain and adrenalin. With the subsidence of the discharge the applications are made with lessening frequency. Boric acid compresses and irrigation are also employed.

The Pathology of Trachoma.

MULLER, Wien (*Von Graefe's Arch.* LVII, 1 Heft), gives as the characteristics of the bacillus, which he discovered and which he considers pathogenic of trachoma, rounded off ends to the rods, negative reaction to Gram's stain. Exclusive growth upon hemoglobin nutritive material at body temperature and on exposure to oxygen. The vitreous and the apparently structureless appearance, even under a magnification of 80 of the edges of the colony. Immobility of the rods. They are usually 0,25 in breadth and about twice that in length, although there is a form which is scarcely greater in length than in width, and give the impression of cocci. The bacilli are usually extra cellular being found in the mucoid substance in which the pus and exfoliated epithelium is incarcerated. They are sometimes very numerous and closely packed, but where less numerous, they may lie one behind the other, parallel, one against the other, or obliquely behind or next to one another. They form no spores. In watery solution of fuchsin many of the bacilli show bipolar staining, and are not to be distinguished from some diplococci. In carbolic-fuchsin this character of staining is of less frequent occurrence. The baccilli form absolutely pure cultures. He has found trachoma of the lacrimal sac present in at least one-half of the cases of conjunctival trachoma,

and is of the opinion that there are mild degrees of trachomatous inflammation of the lacrimal sac, complicated by neither damming back of the secretion or by obstruction of the lacrimal passages, which indeed give rise to very little secretion and which disappear in the course of a few months without sequellae.

The Yellow Coloration of the Macula.

SCHMIDT-RIMPLER, Halle (*Von. Graefe's Arch. f. Ophth.*, LVII. 1 H), in consequence of the criticism of Gullstrand, has examined the color of the macula in the posterior halves of 10 enucleated eyes, and reports the same findings as in his original communication. He was able to demonstrate the yellow color in a specimen which had been immersed in salt solution for 3 weeks time. He found it difficult to assign the yellow color to any one layer of the retina by microscopic examination, as the individual elements are rendered too transparent. He has found a yellow coloration in the nerve fiber and in the nuclei, but is of the impression that it is diffused throughout the entire retinal tissue. He has twice observed a small pin point hole at the fovea; once in a case of carcinoma of the chorioid, and once in a case of atrophic retino-chorioiditis. He thinks it possible that they were artificial, but at any rate the retina must have been unusually fragile.

Aspirin in Ophthalmic Practice.

NEUSTATTER (*Muenchener Med. Woc.*, No. 42 and 20) treats of aspirin as a diaphoretic, specific and anodyne. In all acute and chronic eye affections he employs from 0.5-1.5 g. given in hot lemonade. As a specific he has found it of marked value in iritis, neuritis, palsies, scleritis and episcleritis, especially when of rheumatic origin. As an anodyne he finds it safer than phenacetin.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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(Quarter ending November 30th, 1903.)

Optic Neuritis in Infectious Diseases.

SOURDILLE, Nantes. (*La Clinique Ophthalmologique*, August 10, 1903.) Sourdille has examined the retinae and optic nerves of six cases dying of typhoid fever, in which no antemortem ophthalmoscopic examination had been made. In two only were there any changes found. In one of these a marked chromatolysis at the periphery of the ganglionic retinal cells was found. In the other, the central retinal vessels showed degeneration of their walls. In one case dying of tetanus, chromatolysis of the ganglionic retinal cells could be seen. In two cases dying of pneumonia, no changes were found. The author concludes that in the neuroretinal lesions, consequent to infectious diseases, two pathogenic actions are invoked: one, an impregnation of the anatomical elements by toxins; the other a true microbic embolism of the central vessels.

Quinine Intoxication.

REINA. (*La Clinique Ophthalmologique*, August 10, 1903.) Reina reports a case of quinine intoxication as the result of a dose of three hundred grains. Epigastric distress accompanied by dizziness and loss of consciousness, immediately

followed the ingestion of the drug. This condition persisted for three days' time when the patient partly recovered, complaining of severe headache, tinnitus, and later, deafness and blindness.

Eight weeks after this the hearing returned, the cephalalgia had diminished, and the vision began to return. Six months later the vision of each eye equalled one-third of normal. The visual field of the left eye was reduced to fifteen degrees in and down, to twenty degrees out, and to twenty-five degrees upward, while that of the right eye was similarly, though less reduced. There was complete "achromatopsia." The pupils were slightly dilated, and the irides reacted slowly to light. The ophthalmoscopic picture was that of advanced atrophy seen after embolism of the central artery, combined with the white atrophy, which is consecutive to acute papillitis. The treatment ordered consisted in ocular massage, inhalations of amyl nitrite, the internal administration of strychnine combined with friction of the forehead with tincture of nux vomica and a balsam.

On Some Modifications in the Operations for Ptosis.

DE LAPERSONNE. (*Archives d'Ophthalmologie*, August, 1903.) The maximum effect in ptosis, de Lapersonne says, can be obtained by the operation of Panas, the only objection to the method being the resultant cicatricial distortion. The author has avoided this complication by a modification of the Angelucci plan of procedure, in which he fastens the detached tendon of the elevator muscle to the upper lip of an incision which has been made just above the brow. He does not practice the method of Motais.

He says that when the elevator muscles is not completely paralyzed, but is only elongated, the following method may be employed to advantage. The patient being properly prepared and chloroformed, a long incision is made four or five millimeters above and parallel with the lid margin. This incision is carried down until the tendon of the elevator muscle is exposed, when a strabismus hook is pushed in above the insertion of the same. The tendon is then elevated, and two double needled sutures are passed transversely through the muscle, the inner one extending from without inward, and the outer one from within outward. The tendon is divided, and if necessary, a portion is excised.

The inner suture is passed transversely from without inward in the tarsus, and the external one from within outward. By tying these sutures, the tendon is applied firmly to the tarsus. The method produces but little deformity, and gives fair results.

Stellate Cauterization of the Cornea.

PECHIN. (*Archives d'Ophthalmologie*, August, 1903.) Pechin reports three cases of corneal staphyloma in which he has employed stellate cauterization with the actual cautery. His conclusions are: First, in total or in partial staphyloma which is associated with a hydrophthalmic process, the operation of choice is the use of the actual cautery. It is preferable to enucleation, which may be considered as an unnecessary mutilation. It is better than a keratotomy, since it leads to the production of a normal size, and a proper form of the globe. By tattooing, he says, a good appearance can be later obtained. In addition, keratotomy necessitates the employment of an artificial eye. If cauterization produces too marked an involution, an useful and an often sufficient resource can be had by section of the rectus muscles followed by tattooing. Second, actual cauterization on glaucomatous, staphylomatous, and painful eyes should be practised: Intervention and success of this kind may oftentimes render the method in such cases the one of choice when enucleation as a last resource is thought of.

Mariotte's Spot and the "Region of Mariotte" in the Myope.

CAUTIONNET. (*Archives d'Ophthalmologie*, August, 1903.) Cautionnet reports thirty-four cases of myopia in which he studied Mariotte's spot and the region of Mariotte. He concludes: first, that there is a real, if not, an absolute, correspondence between the enlargement of the blind spot and the presence of the conus; second, that the scotomatous region which surrounds the region of Mariotte is in relation with the simple diffuse depigmentation areas of the chorioid that surround the conus or the papilla—and of which there are cases in which in the absence of a conus, the blind spot though normal, is surrounded by a manifest region of Mariotte; third, that ordinarily, the appearance of this region changes from white to blue, to red, and to green; and fourth that the region presents prolongations which are rendered

more prominent by its white and green coloration than by any other form of color change.

The Tubercular Lacrimal Tumor.

ROLLET. (*Revue générale d'Ophtalmologie*, June 20th, 1903.) Tuberculosis of the lacrimal sac, Rollet says, is rare and its occurrence even has been denied. He has collected reports on nine cases of which four were personal ones. Hertel, he tells us, found four cases of tuberculosis of the lacrimal sac during a systematic examination of fifty-two cases. The author has detected tuberculosis of the sac four times in forty-six cases in which the sac had been extirpated. In the instances reported by the author he has excluded all but those of primary tuberculosis.

In four of the nine cases there was tuberculosis of some distant part of the body, but there was never any pulmonic involvement. The infection had lasted from a few weeks to six years. The lacrimal sac involvement begins, he says, with a fungus transformation of the mucous membrane in association with lardaceous or fibrocaceous formations. This condition may be accompanied with a purulent discharge which is followed by a "cold intraocular abscess" with fistulation; though more rarely a secondary ostitis. A swelling of the preauricular or submaxillary glands is, he thinks, of diagnostic value. Prognosis is good when radical extirpation is performed. This procedure should be accompanied by dissection and not by cauterization or curetting. After removal of the sac sutures are not necessary, a simple dressing being sufficient.

Ocular Tuberculosis Consecutive to a Wound of the Cornea by an Infected Toy.

DOR. (*Revue générale d'Ophtalmologie*, June 30th, 1903.) Dor reports the case of a four year old boy whose parents though healthy were living in the same house in which there were two cases of syphilis. The cornea of the right eye of the patient was injured by the child falling upon a toy. The traumatism was followed by a keratitis, a corneal abscess, and an iritis. Two months after the injury, the corneal wound was the seat of a thickened yellow non-vascular cicatrix from which a mass which was adherent to the anterior capsule, extended to the iris. An iridectomy

was performed. Three days later small yellowish elevations were noticed on the iris. One of these was excised, and a guinea pig was inoculated with the material—from which the animal developed tuberculosis, thus confirming the diagnosis. The eye was enucleated and upon section exhibited numerous tubercles situated in the ciliary body and the chorioid.

Granulations.

BOUCHART. (*Recueil d'Ophtalmologie*, May, 1903.) Bouchart reviews the various theories which are held regarding the histology, the pathogenesis, and the treatment of trachoma. The characteristic element, he says, appears to be found rather in the evolution and the series of the lesions. He believes that specific lesion is lacking. Likewise, he states, no specific causative agent is known. The most probable etiologic factor resides rather in general debility, especially that which is the result of hereditary or racial type.

Without being absolute, the infection of the eyes of a robust individual without hereditary taint is rather rare, and when it does occur, cure is much more rapidly attained.

The local treatment consists in the use of antiseptic solutions and the production of a mild reaction by the application of such drugs as the salts of silver, or by massage which produce absorption of the trachomatous elements; and, finally, in the evacuation of the trachomatous masses by means of expression, brossage, curetting, cauterization, etc. The general treatment includes the combatting of faulty diatheses and the improvement of unfavorable hygienic conditions.

Thoughts Upon a Case of Tardy Ocular Hereditary Syphilis.

SEUDRAL. (*Recueil d'Ophtalmologie*, May, 1903.) Seudral reports a case of hereditary syphilis in which interstitial keratitis appeared at seven years and was apparently cured. A relapse occurred five years later, but the affection reached the deeper parts of the eye; this attack was accompanied with a gummatous formation on the tibia.

In regard to his case, the author concludes: 1. Hereditary syphilis frequently produces interstitial keratitis and often is cured, not leaving any traces of the local disease, no matter what treatment is employed 2. Relapse is frequent, espe-

cially when the first attack has left corneal opacities. It is always grave, because it involves the deeper membranes. To avoid a mistake in prognosis no opinion should be given until all of the symptoms have disappeared. He considers that mercurial inunctions constitute the best form of therapy; in fact, they are indispensable for at least one or two years' time—depending upon the severity of the case. Iodide of potassium, or all other treatment from which mercury is omitted, produces only an apparent cure and does not prevent relapses. 3. Hereditary syphilis develops on a lymphatic diathesis, thus explaining the tenacity of the disease as well as the indication at times of a combined treatment of iodine and arsenic. 4. The treatment of interstitial keratitis should be that which is usually used in hereditary syphilis. In the ocular manifestations of the disease, mercury given alone has offered better results than the combined form of treatment. Potassium, which has a remarkable action on certain conditions of syphilis, has a very doubtful beneficial action upon the ocular manifestations of the disease.

Contribution to the Study of Multiple and Complex Paralysis of the Muscles of the Globe of the Eye.

YVERT. (*Recueil d'Ophtalmologie*, July, 1903.) Yvert reports a case in a male of forty years of age, in which there was a paralysis of the fourth pair of the left eye associated with incomplete paralysis of the third pair of the same side; affecting the filaments to the inferior oblique muscle, to the elevator of the upper lid, to the muscle of accommodation, and to the sphincter of the iris. In the absence of all causative elements he provisionally considered the condition as an early symptom of locomotor ataxia, the patient being placed upon appropriate treatment.

On a Case of Acute Papillary Atrophy Consecutive to Uterine Hemorrhages.

CHEVALLEREAU. (*Archives d'Ophtalmologie*, July, 1903.) Chevallereau reports the case of a female, aged thirty-eight years, in whom menses began at ten years of age, the periods being usually accompanied by severe headaches. The patient became pregnant nine times, with a normal termination in seven. Since the last pregnancy, three years before the author saw her, she had had almost continual and oft-

times abundant uterine hemorrhage. It was after one of these hemorrhages that she became suddenly blind in the left eye, and a few hours later in the right. Examination of the eyes twenty-four hours after the accident to the left eye showed absolute blindness, dilated pupils, and irides inactive to light, but reacting to accommodation.

The ophthalmoscope revealed blanched discs with their edges slightly blurred, and a few peripapillar hemorrhages. The retinal vessels appeared normal. Six months later the hemorrhages had disappeared. The disc margins were distinct, the discs themselves being atrophic and the retinal vessels slightly contracted. Blood examination was negative. The author gives a digest of similar cases so far reported (twenty-seven in all). The uterine hemorrhages in the cases noted followed labor at term nine times and an abortion ten times. They were independent of pregnancy eight times. There was one case of uterine fibroma. In all of the cases the hemorrhage was abundant. The usual general disturbances were cephalalgia, weakness, syncope and vertigo. In one case there was pain in the ears. In another there was a paraplegia, which was followed by death. In another sudden death took place. Visual disturbance appeared immediately in three cases; and in varying periods of time—from two to twenty-one days—in the remainder of the cases. Amblyopia was first complained of, it slowly developing into blindness. The visual loss was usually the same on both sides. In six cases it was especially pronounced as limited to the right side. In two it was to the left.

The pupils were generally dilated and the irides reacted poorly; and in one-half of the cases not at all to light. The visual fields were irregularly contracted. Ophthalmoscopic examination usually revealed a condition of complete atrophy. In several cases the discs were merely "pale." As a rule the disc margins were distinct. In five cases there was an optic neuritis. The calibre of the retinal vessels was most frequently diminished in size.

In but three cases were any retinal hemorrhages noted. Histologic examination has been made three times, revealing a degeneration of optic nerve and retina. In one case there was a fibrous endarteritis. These changes, he says, result from the contraction of the vessels following the hemor-

rhages. Prognosis is usually grave. Treatment, when the case is severe at the beginning, should consist in inhalations of amyl nitrite just as soon as this drug can be employed without risk of causing another hemorrhage.

Nature and Treatment of Prelacrimal Tumors.

TERSON. (*Archives d'Ophthalmologie*, July, 1903.) Terson reports a case of prelacrimal cyst, from which, and a study of such conditions, he concludes: first, that there exist prelacrimal pouches with associated integrity of the lacrimal passages; second, histologically, these appendices may have the same structure as the lacrimal sac; third, this similarity of structure proves the identity of their origin, and demonstrates that a portion of the lacrimal sac may be isolated and transformed into a closed and independent vesicle; and fourth, simple incision does not prevent relapses.

Partial ablation with curretting and cauterization, carefully avoiding any penetration of the lacrimal passages when they are intact, is his proceeding of choice; although incision and cauterization with silver nitrate, he says, may give success. Total extirpation, he thinks, should be reserved for mucocoeles with obliteration of the excretory passages.

Experimental Work on the Centers of Origin of the Oculomotor Nerves and the Pathetic in the Dog.

DEMARIA, Buenos Ayres. (*Archives d'Ophthalmologie*, July, 1903.) From this study Demaria draws the following conclusions:

(A). Oculo-motor.

(a). External and internal muscles of the eye.

1st. In the center of origin of the common oculomotor nerve there are zones which are the respective centers of the external muscles of the eye; these zones, although well limited, have no fixed contour.

2nd. The zone corresponding with the elevator of the upper lid is situated for the most part in the upper and the external portions of the principal lateral nucleus of the same side (direct fibers); the smaller portion is symmetrical and is situated in the nucleus of the opposite side (crossed fibers).

3rd. The zone corresponding with the superior rectus

muscle is found for the most part in the medium and the external portions of the nucleus of the same side (direct fibers) and the smaller portion is found in the symmetrical portion of the opposite side (crossed fibers). The lateral cells of Bernheimer do not participate any more in the formation of this zone than they do in those zones which are near to it.

4th. In that which concerns the internal rectus muscle:—the zone of the major or direct portion, is localized in the median and the posterior parts of the internal side of the main trunk of the third pair; and the smaller or crossed portion is symmetrical and situated in the opposite nucleus. The central nucleus of Perlia belongs to this zone.

5th. Relative to the inferior rectus:—the zone for it has two portions the larger and the crossed one in the internal side of the median and the posterior parts of the principal nucleus; and the other, the smaller and the direct, which is symmetrical and situated in the opposite nucleus.

6th. The corresponding zone of the inferior oblique muscle. This is composed equally of two parts, the crossed, situated in the external side of the distal extremity of the principal nucleus; and the other, the direct, which is situated in the opposite nucleus. Of the lateral cells of Bernheimer, only those which are near to the zone enter into its composition.

7th. The remaining free parts probably belong to the internal muscles of the eye; but it is logical to suppose that in these portions are also placed the zones of innervation of the deep recti (which the dog possesses).

8th. The extirpation of the internal muscles of the eye is not followed by chromolytic alterations in the nucleus of Edinger-Westphal; nor those of Darkschewitsch; nor of any others which form the nucleus of the common oculomotor nerve.

9th. The only nuclei which belong incontestably to the center of origin of the third pair are the principal lateral nucleus pair, the central pair of Perlia, and the lateral cells of Bernheimer.

10th. The nucleus of Darkschewitsch does not with any certainty belong to the oculomotor centers, since the relation of that of Edinger-Westphal to the same center is doubtful.

(B). *Fibers of the Third Pair.*

11th. The fibers of the third pair undergo partial decussation.

12th. The larger part of the crossed fibers originate in the distal parts of the principal nucleus; but it must be admitted that there are some (although very few) fibers which come from the proximal parts.

(C). *Pathetic (Nucleus and Fibers).*

13th. The pathetic nerve innervates the superior oblique muscle and its center of origin is found in the places which are described as being placed in the posterior longitudinal fasciculus.

14th. The fibers undergo complete decussation.

(D). *Ciliary Ganglion.*

15th. Extirpation of the internal muscles of the eye (sphincter of the pupil and the ciliary muscle) is followed by a chromatolysis of all the cells which form the ciliary ganglion of the corresponding side.

16th. The ciliary ganglion is the peripheral center for the internal muscles of the eye.

(E). *Cilio-spinal Center.*

17th. Extirpation of the dilating muscle of the pupil does not determine any chromatolytic alterations of the spinal cord, but physiology teaches us that such a center exists, although its place is not yet exactly known; which makes it suppositional that situated between the muscle and its medullary center, there are one or several neurones which are in contact.

Unilateral Exophthalmos in Basedow's Disease.

BISTIS. (*Archives d'Ophthalmologie*, July, 1903.) Bistis reports three such cases. In all there were tachycardia, and Stellwag's and von Graefe's symptoms, and in one there was a slight tumor. In none was there any goiter.

A Forceps-Scissors for the Incision of Secondary Cataract.

ROCHON-DUVIGNEAUD, Paris. (*Archives d'Ophthalmologie*, Sept., 1903.) Rochon-Duvigneaud believes that the forceps-scissors is preferable to a needle or knife in the operation upon delicate secondary cataracts. There is, he says, greater danger of loss of vitreous in its use, but the opening which is obtained is better, thus giving the advantage to the former instrument.

The one used by the author has curved blades which are united at an obtuse angle with spring handles. The blades are curved downward, the upper one being made obtuse in order that there may not be any injury to the cornea against which the membrane lies after opening the anterior chamber. The lower blade is pointed so as to perforate the membrane. The incision must be continued to a position a little below the inferior margin of the pupil. A preliminary iridectomy is usually necessary.

Cylindroma of the Lacrimal Gland.

MOISSONIER. (*Archives d'Ophthalmologie*, September, 1903.) Moissonier reports the case of a forty-two-year old female, who, in 1899, consulted him upon account of an increasing prominence of left eye which had commenced one year previously. From time to time the patient had felt a sharp pain in the forehead and in the temple. There was not any specific history, and the examination was negative, except for a non-reducible exophthalmos of the left eye, which was displaced directly forward.

In spite of the treatment, the exophthalmos continued to increase. In June of last year a frontal neuralgia developed, vision had fallen to one-tenth of normal, and the optic disc appeared cloudy and edematous. Under the upper external orbital margin a smooth, dense tumor, two centimeters wide and four millimeters thick, was found. The operation of Krönlein was done, revealing the presence of a rounded tumor which occupied all of the external parts of the orbit and extended backward and upward. This mass was easily removed and the wound was closed.

Convalescence was uneventful, the ocular movements being normal and vision improved. Three months later there was a relapse, during which small, hard nodules appeared around the orbital margin, this being accompanied with pain in the corresponding temple. Histologic examination of the growth showed it to be a cylindroma, corresponding with a slowly growing epithelioma which was affected with a special degeneration of its connective tissue, and is usually considered as mucoid. In all, the development of the tumor was similar that of a benign growth.

Removal of the mass, he says, can be made through the eyelids or by the method of Krönlein, depending on its size.

In three of the five cases relapse of the tumor ensued. In one of these an exenteration was followed by relief for three years time, when the case passed from view. In the others, the reports are incomplete.

Coloboma of the Uveal Tract and Microphthalmus with Luxation of the Inferior Maxillary Bone Into the Orbit. Anatomic Examination.

TERRIEN, Paris. (*Archives d'Ophthalmologie*, Sept., 1903.) Terrien reports the anatomic findings in the case of coloboma of the uveal tract associated with microphthalmus occurring in a rabbit.

The coloboma occupied the usual position down and in. Projecting into the lower outer anterior portion of the orbit the coronoid process of the inferior maxillary bone was found. In the thickened floor of the orbit a molar tooth could be seen, showing that the luxation was rather the result of involution changes than that of traumatism.

In the sclera, at the posterior pole, there was a cystic pouch. The uveal tract was absent at its ordinarily anterior part, being recognized for a short distance at the equator and appeared again at the posterior pole in its usual form and situation.

The external retinal layer extended from the origin of the ciliary body to the beginning of the cyst at the posterior pole of the eyeball. The internal layer passed from the ciliary body to the posterior lens surface, being normal until it reached the posterior pole of the same where it became invaginated in a glove finger-like figure with the formation of a cyst. The posterior surface of the lens retained its vascular sheath.

The condition, the author says, is ascribed to involutional disturbances, all inflammatory changes that may have occurred, playing but secondary role.

It is impossible, he tells us, to state whether the changes in the internal retinal layers were primary or secondary to the uveal coloboma. The invagination of the internal retinal layer and its adherence to the posterior lens surface probably resulted from primary changes in both.

Ophthalmoplegia and Arteriosclerosis.

PECHIN and ROLLIN. (*Archives d'Ophthalmologie*, Sep-

tember, 1903.) Pechin and Rollin report the case of a sixty-four year old male, syphilitic with arteriosclerosis, aortitis, enlarged heart, chronic nephritis and tabes dorsalis.

On the left side there was complete external ophthalmoplegia with partial optic nerve atrophy. On the right, there was an incomplete ptosis with paralysis of the superior rectus muscle.

On autopsy, extreme sclerosis of all of the bloodvessels with marked dilation of the left cavernous sinus and ophtalmic artery were found. On the right side similar, though much less marked, changes were recognizable. The ocular symptoms, which at first were supposed to be due to tabetic degeneration, were shown in reality to be the result of mechanical disturbance.

The authors remind us that a similar case is reported by Soelder, in which there were partial paralysis of the soft palate, incomplete deafness with ringing in the left ear, and titubation. Auscultation of the cranium revealed a musical bruit. The ocular examination showed beginning optic nerve atrophy with binasal hemianopsia. These various symptoms, he says, were ascribed to an aneurismal dilation of the basilar, vertebral and internal carotid arteries. Syphilis, he says, determines not only local anemia from arterial changes with a consecutive nuclear degeneration, but also gives rise to aneurismal dilation with associated pressure palsies.

The Role of the Capsule of Tenon in Operations for Strabismus.

DE WECKER, Paris. (*Annales d'Oculistique*, July, 1903.) de Wecker in reviewing three new modifications in the operation for strabismus, discusses the role of the capsule of Tenon upon the same. He states that he early insisted upon the importance of the capsule in these operations and especially that for muscular advancement.

Trousseau, he says, has criticised his use of the term "capsular advancement," because the capsule between the cornea and tendon is not advanced. This, however, he believes, does not apply to the muscular aponeurosis. He thinks that partial tenotomy is only of temporary value at the best, and that any capsular dissection, without division of the tendon, is of no effect whatever. He has found that a tenotomy limited to detachment of the tendon reduces adduction some

ten degrees and abduction some fifteen degrees, any increase of these amounts being due to capsular dissection.

Diphtheritic Ocular Paralysis and Hemiplegia.

TELLAIS, Nantes. (*Annales d'Oculistique*, July, 1903.) Tellais reports four cases of post diphtheritic paralysis. In the first, a boy of nine years of age, there was complete paralysis of the right oculo-motor nerve with paralysis of accommodation and slight ptosis on the left side, partial paralysis of the soft palate, and slight hemiplegia. Recovery was complete in eight months' time. In the second case, a child of six years of age (a sister of the first case) there were paralysis of accommodation, paresis of the left superior rectus muscle, paresis of the soft palate and slight paraplegia. Recovery was complete in a month's time.

In the third case, a boy seven years of age, there were bilateral paralysis of accommodation, complete paralysis of the right oculo-motor nerve, and paralysis of the left superior and inferior rectus muscles, followed two weeks later by the development of a right hemiplegia terminating in death.

In the last case (a child of seven years of age) a paralysis of the right external oblique muscle which disappeared in three weeks' time, appeared. Contrary to the usual observation, the paralysis affected the iris muscle as well as that of the ciliary body, and thus did not produce the inverse of the Argyll-Robertson pupil phenomenon.

They inform us that about fifty cases of diphtheritic hemiplegia have been reported, the lesion being attributed either to an embolus arising from a cardiac thrombus or to a cerebral hemorrhage.

Dejerine, Bühl, Oertel, Boger, and Damaschino, they remind us, have reported interstitial and capillary hemorrhages among the lesions of diphtheria. In the two cases given by the author, the hemiplegia is ascribed to hemorrhage rather than to an embolism.

The diphtheritic paralysis, they say, have been considered by some to be due to an ascending neuritis; by others, as secondary to nuclear lesions; and again the result of vascular disturbances.

Antitoxin, they state, is believed to have no effect upon an established form of paralysis.

Extraction of Cataract in Its Capsule After Zonulotomy.

GRADENIGO, Padua. (*Annales d'Oculistique*, July, 1903.) For six years past Gradenigo has extracted cataracts with their capsules through the cornea after zonulotomy. He believes that zonulotomy should be performed during the procedure of extracting the lens through the sclera.

The danger of prolapse of the vitreous humor in the latter method can be largely avoided by making a short incision with a narrow von Graefe knife, and extending the same with the scissors. The scleral cut is made parallel with the limbus of the cornea at the base of the posterior chamber. The scleral incision has the advantage of leaving a normal cornea and a round pupil.

Disturbance of Vision by Exaggeration of Binocular Association.

JANET. (*Annales d'Oculistique*, July, 1903.) Janet cites the case of a female, sixty-five years of age, who until her fiftieth year, had suffered with marked hysterical disturbances, later complaining of migraine, constipation, cardiac asthma, etc.

In 1900 she developed a hemorrhagic form of retinitis in each eye, which terminated in recovery on the right side and with loss of vision on the left. The blindness on the left side was accompanied with painful luminous phenomena, such as flashes of lightning, "the lights of roman candles," etc.—of such severity and of so great persistency that the patient wished to commit suicide. Enucleation being refused, a section of the optic nerve was performed. This operation relieved the painful luminous phenomena, but the patient noticed that, upon attempting to use the right eye, a dancing and sparkling white cloud appeared immediately before the same. It was discovered that pressure on the blind eye would remove the visual disturbance of its fellow for a time, and that in the act of excluding the vision of one eye, as is done during revolver shooting, the patient could see very well. This led to the use of a tube which was accurately placed before the right eye in such a way as to exclude the fellow eye had it been active. The necessity of the exclusion of the blind eye is presumed by the author to have been due to an exaggeration of the binocular association, this being dependent upon the constant preoccupation of the left

(or blind) eye during the period of painful luminous impressions.

The cloud before the right eye he assumed to have been due to a defect of accommodation, its moving character being dependent upon the instability of fixation.

The author hopes that in spite of the age and the neuro-pathetic history of the patient to establish a habit of monocular vision.

The Dermatologic Classification of Blepharitis Ciliaris.

TERSON, Paris (*Annales d'Oculistique*, July, 1903), divides blepharitis ciliaris into two classes—the suppurative and the squamous. In the suppurative form, he says, an examination of the crusts reveals the presence of only the staphylococcus aureus, or more rarely the staphylococcus albus. The process begins as a folliculitis, sometimes deep and sometimes superficial. This folliculitis, with its temporary complications of abscesses and styes, may pass into a chronic ulcerative process, which involves especially the lower lid, giving rise to a destruction of the cilia and accompanied in some cases by hypertrophic and cicatricial lesions of the lid margins. In the beginning this ciliary folliculitis may be due to an impetigo or to an eczema; but it often develops into a true sycosis. Besides the well known local and general causes of this affection, the author suggests a modification of the secretions which renders them more favorable culture media, thus increasing the dangers of infection.

The squamous form includes several types according as the ciliary secretions are furfuraceous, appear as yellow crusts, or are of an oily watery nature. In all of these forms the cilia are not seriously affected, the skin surface is not broken, and the follicles are not the seat of suppurative infection—although they may be invaded by other microbes.

In the furfuraceous type, which is probably similar to simple pityriasis, bacteriologic examination of the scales reveals besides the staphylococci the bacillus which has been described by Malassez and Unna.

The author tells us that the German authors consider the various forms of blepharitis to be simply varieties of eczema—a position which, he says, is opposite to that which is assumed by the French authorities.

Intraocular Tuberculosis. Dangers of Enucleation.

ROGMAN. (*Annales d'Oculistique*, August, 1903.) Rogman reports two cases of intraocular tuberculosis in which enucleation was followed by a fatal result. The first was that of a seventeen months old child who had a tubercular involvement of almost the entire anterior portion of the eyeball. A few days after enucleation, the patient began to fail, death from pulmonary tuberculosis taking place two years later.

The second case was that of a child who was thirteen years of age, whose mother had died of phthisis. The patient had always enjoyed health until the development of a tubercular affection of the right eye. Enucleation was performed, and was followed two months later by the death of the patient from meningitis.

Fatal results after enucleation for intraocular tuberculosis, the author states, are reported in eleven cases: eight times from meningitis; twice from pulmonary phthisis; and once from miliary tuberculosis. In two, there were local relapses, which in one instance was followed by death. In six of the cases, it is expressly stated that there was good general health at the time of the ocular involvement.

The meningitic complications, the author says, may be regarded as due to an independent involvement of the eye and meninges with a coincident appearance of grave postoperative invasion; or to a secondary involvement of the meninges before any surgical intervention. These explanations, however, do not, he believes, exclude a third probability, that the operation itself is the direct cause of transmission of the infection from the eye to the brain. This last view, the author thinks, is sustained by the fact that in those cases in which meningitic complications have followed, the sclera has been invaded or perforated by the tubercular process. In two instances in which there was a local relapse, this explanation, he says, is certain. Operative interference is therefore, he believes, indicated as soon as the process is found to be definitely increasing. In the more advanced cases exenteration of the orbit with removal of the periosteum should be performed.

The Composition of the Aqueous Humor in Cases of Senile Cataract.

URIBE-TRONCOSO, Mexico. (*Annales d'Oculistique*, Aug.,

1903.) Uribe-Troncoso concludes his article as follows: I, The quantity of albumin does not increase in the aqueous humor during the formation of cataract as was formerly believed; II, In beginning nuclear cataracts, there is a considerable increase in the proportion of the saline elements of the aqueous humor, this not being noted in beginning cortical cataract; III, When approaching maturity, the composition of the aqueous humor always approaches that of normal; IV, In hypermature cataract, analysis demonstrates an increase in the organic elements of the aqueous humor; V, As there exist two distinct physical stages in the formation of cataract —(the one of the absorption of water with swelling, and the other of loss of water with contraction) it is not possible to admit that an increase in the quantity of the salts of the aqueous humor could be the cause of the first of these, for it is well known that the osmotic current; are always directed towards the medium which is the more charged with salt; and VI, The remarkable increase in the proportion of the saline elements of the aqueous humor in beginning cataract leads to the belief that during the period of incipient cataract there is a loss of water, with a rapid dessication of the nucleus; and that when the nucleus contracts, cataractous alterations commence in the perinuclear zone.

On the Spontaneous Resorption of the Crystalline Lens in Adults, Following the Traumatic or the Induced Form of Cataract.

ARMAIGNAC, Bordeaux. (*Annales d'Oculistique*, August, 1903.) Armaignac has observed the spontaneous absorption of the crystalline lens as late as the fortieth year. The danger from glaucoma, he says, increases with age. He believes that after thirty-five years of age the lenticular masses, should they be abundantly situated in the anterior chamber, should be evacuated through a curvilinear corneal opening. The corneal incision should be made one and a half millimeters from the limbus, and eserine should be instilled after the operation, in order to prevent iris prolapse.

In opening the capsule, the author makes a crucial incision, which, he says, always leaves a pupil of sufficient size for delivery of the lens; one procedure being usually efficient. Two punctures are made, one in the upper and the other in

the outer part of the cornea. The crucial incision employed is almost as large in the infant as it is in the adult.

The author has never noted the occurrence of glaucomatous complications, as reported by other authors. He has found that in patients of twenty to twenty-five years of age, the nucleus has already begun to harden, and in consequence, its absorption may be very slow. The lens may also float in the aqueous humor or it may sink to the bottom of the anterior chamber without producing any bad symptoms. When the absorption of the nucleus ceases, the remaining portion should be extracted.

In the treatment of high myopia by extraction of the crystalline lens, the author has had but little experience.

On Exanthematous Punctate Superficial Keratitis Occurring During Measles.

TRANTAS, Constantinople. (*Annales d'Oculistique*, August, 1903.) Trantas has examined forty-one cases of measles and in thirty-one of them has observed more or less marked corneal alterations. These changes, he says, consist of small gray points, located in the central and superficial layers. When these points are numerous, the corneal epithelium appears hazy and roughened; irritative phenomena being usually present. He has found that the keratitis is bilateral and that it generally commences on the third, the fourth or the fifth day of the eruption. Rarely is it observed on the second day or as late as the sixth after the disappearance of the eruption. The keratitis ordinarily disappears in three or four days' time, but it may persist for a week, in which case the deposits are usually situated relatively deep in the corneal stroma. Age and sex do not seem to exert any influences upon the phenomena.

He believes that the condition is to be viewed as a true corneal exanthem, and not one which is at all similar with the herpetic lesions which are occasionally met with in measles or in the pustular lesions of smallpox; conditions which are relatively due to a lymphatic diathesis or to a secondary infection. The condition is also unlike the central form of punctate karatitis described by Fuchs and others, in that the latter is often unilateral and of much longer duration.

Exanthematous karatitis, he says, may be of diagnostic

value in differentiating measles from other affections. In scarlet fever a similar form of keratitis may be present, although the corneal lesions are larger and fewer in number.

On Some Ocular Manifestations Found During the Course of Measles.

MORAX, Paris. (*Annales d'Oculistique*, August, 1903.) Morax divides the blepharo-conjunctival manifestations of measles into two classes; the first being termed morbillous blepharo-conjunctivitis, and the second a condition which is the result of an infection which has been antecedent or is superimposed on the first. The first form, or the morbillous conjunctivitis proper, was observed in twenty-two out of twenty-six patients. The ocular affection either precedes, accompanies or follows the eruption, but it never appears previous to the development of the general symptoms. The subjective signs of photophobia, itching, etc., are all moderate in degree—as are also the objective signs. An examination of the lacrimal secretion fails to reveal the presence of any special micro-organisms. The ocular symptoms usually last for about four or five days.

In four cases, the second type of affection was noted. In three of these the conjunctival symptoms had existed some days to two months before the attack of measles had developed. In these three cases, two showed themselves in the form of an acute contagious conjunctivitis which was due to the Week's bacillus, while the third exhibited itself as a sub-acute conjunctivitis which was dependent upon a diplobacillus. In the fourth case, an acute conjunctivitis with abundant discharge developed on the the third day of the general disease. Bacteriologic examination of the discharge revealed the presence of the Pfeiffer bacillus, the Pfeiffer bacillus the author tells us, resembles the pneumococcus in that it may lead a saprophytic existence, developing an active irritating action under favorable conditions.

Relapsing Spontaneous Hemorrhages of the Orbit.

PETIT, Rouen. (*Annales d'Occulistique*, August (1903). Petit reports two cases of spontaneous orbital hemorrhage. In the first, a man of thirty-six years of age suddenly felt a blow back of the right eye. This was followed by a sensation of tension, vision being not much affected. Four hours later

the author found an axial and nonreducible exophthalmus. The lids and motions of the globe were normal, the iridic reflexes were preserved, and the fundus, except for the presence of a whitish exudate situated up and in, was healthy in every respect. Vision was the same in both eyes. Beyond a slight trace of albumen in the urine, there were not any general symptoms. Six weeks later, except for a patch of gray white atrophy at the seat of the retinal exudation, recovery was complete. This attack, the author tells us, was the third from which the patient had suffered.

In the second case, a female of sixty-three years of age was seized with a severe pain and feeling of tension in the right orbit after symptoms of disturbed cerebral circulation. This was followed by an exophthalmus. The following day examination revealed a protrusion of the eyeball, a marked edema of the lids, chemosis, and grossly limited and painful motions of the globe. There were not any lesions of the fundus.

By means of an orbital puncture, one-half an ounce of blood was obtained, causing the exophthalmus to almost disappear for one days time. Five months later recovery was complete. In this case there was a history of rheumatism, valvular disease of the heart, and nephritis.

Fifteen cases of the affection, the author informs us, have been reported. He believes that the mechanism of the lesion and its relation to intraocular lesions which at times accompany it, are not definitely understood. In general the presence of disturbances in the fundus has been followed by serious visual results. Etiologically in most of the reported cases, there have coexisted either a vascular lesion with kidney changes or hemophilia.

Contribution to the Study of Cysts of the Inner Walls of the Orbit.

VACHER, Orleans. (*Annales d'Oculistique*, September, 1903.) Vacher reports two cases of cysts of the inner orbital wall. The first was that of a female aged sixty-four years, who eight months previously had felt some pain in her eye, and had noticed a small swelling situated at the inner angle. This swelling increased, depressing the eye down and out, though not producing any diplopia for distance. Examination showed a walnut sized tumor, which was round and slightly fluctuating, situated at the inner orbital angle. The

lacrimal passages were free. The nasal passages were obstructed by a marked enlargement of the middle turbinate bone. The tumor mass was uncovered by means of a semi-lunar incision made over the upper part of the orbit. It was found to consist of a cystic pouch which was adherent to the inner orbital wall. Upon opening the cyst there was an escape of a creamy fluid. After irrigation, the cyst was found to involve the frontal sinus, the ethmoid cells, and the middle turbinate bone. It had displaced the inner orbital wall horizontally outward.

Four months later recovery was complete.

The second case was in a thirty year old woman who for years had noticed a small tumor situated at the inner angle of the orbit. Later the patient suffered from lachrimation and from some pain seated over the growing tumor.

Examination revealed the presence of a dense pigeon-egg sized tumor situated at the inner angle of orbit, which displaced the eye [down and out some three or four millimeters. Upon operation, a cyst, resembling a silk-worm cocoon, was removed intact. The osseous walls about the same, which were in good condition, were all found displaced. Convalescence was uneventful.

On Hemorrhagic Retinitis.

AHLSTROM, (*Annales d'Oculistique*, September, 1903). Ahlstrom reports a case of hemorrhagic retinitis in a fifty-seven year old man. Five months after the development of the attack, the eye was removed for absolute glaucoma. Microscopic examination revealed as the most important vascular lesion a thickening with a hyaline degeneration of the arterial walls in the optic nerve and the retina; particularly in the capillaries. These changes were similar to those seen by Friedenberg, Stoelting, and Reimac.

The Accommodative Asthenopia of Donders.

BULL, Paris. (*Annales d'Oculistique*, September, 1903.) Donders, Bull tells us, believed that the phenomena of asthenopia arose entirely from fatigue of the muscle of accommodation—a condition due to the hypermetropic structure of the eye. The author is convinced from studies, and especially those which have been made with the Holmes stereoscope, that the symptoms of fatigue arise rather from undue

strain upon the external muscles. While using the instrument, the cards were moved from beyond the punctum remotum to within the punctum proximum, and although at the latter position, in which the patient was rendered artificially presbyopic, the images were indistinct, yet there was not any fatigue. If, after this is done, the two pictures of which the card is composed are brought nearer together, the amount of positive convergence can be determined.

The constant effort to maintain fusion, he says, soon exhausts the internal rectus muscles and produces symptoms which are similar to those that are obtained by one who is suffering from insufficiency of the external rectus muscles. By separation of the test cards, the amount of negative convergence can be ascertained and a condition of artificial esophoria produced.

In most cases of asthenopia the relief given by convex lenses is marked and results from the lessened innervation of the rectus muscles. In many cases the relief following tenotomy of the internal recti is proof of the origin of the trouble in the external rectus muscles. (Original in English published in full in these ANNALS, July, 1903.)

Treatment of Relapsing Hemorrhages of the Vitreous Humor by Hypodermatic Injections of Gelatine Serum.

FROMAGET, Bordeaux. (*Annales d'Oculistique*, September, 1903.) Carnot, Fromaget says, has best demonstrated the hemostatic properties of gelatine serum, but has not yet dared to recommend it as a general hemostatic from fear of embolism. Lancereaux, he says, however, employed the method in two cases of aneurism of the aorta with very good results.

Gelatine serum, the author says, produces two effects: First, hemostasis, and, second, a modification in the constitution of the dyscrasic blood.

Fromaget reports two cases of relapsing vitreous hemorrhages occurring in men of twenty-three and twenty-four years of age. In both the pathologic tendency was completely overcome by the hypodermatic use of the gelatine serum. The author employed a two per cent. strength solution injected in amounts of fifty to one hundred and fifty centigramme doses beneath the skin of the abdomen.

In the first case two injections of fifty centigrammes were

made, and in the second six injections of one hundred and fifty centigrammes each were employed.

The injections produced slight pain, with some local and general reaction.

He tells us that when absolutely sterile gelatine serum is not available, chloride of calcium may be given in doses of five to six grammes each in twenty-four hours' time.

On Capsulomuscular Advancement.

Jocqs, Paris. (*La Clinique Ophtalmologique*, 25th August, and 10th September, 1903.) De Wecker, in a recent article, Jocqs says, states that the author is in error in his criticism that capsulomuscular advancement leaves a disfiguring swelling and that the operation of muscular advancement proposed by Jocqs is practically the same as the Landolt method. The author maintains that a deformity of some extent must result if the advancement is properly done, for its absence would show that no folding of the tendon and its capsule had persisted. The author's operation, he says, differs from Landolt's in that Jocqs seizes the tendon with forceps, detaches it from the globe, and incises the capsule perpendicularly to the muscle for almost one centimeter's distance on both sides, thus obtaining a broad musculocapsular flap which does not in any way resemble the well isolated muscle which is upheld by a strabismus hook as in the method of Landolt.

Remarks on a Case on Sympathetic Ophthalmitis.

DELBES, Perigneux. (*La Clinique Ophtalmologique*, August 25, and September 10, 1903.) Delbes reports a case of sympathetic ophthalmitis in a child, the process developing four and a half years after the receipt of an injury. Marked temporary relief followed the subconjunctival use of a ten per cent. strength salt solution. In a second case, in a child, the employment of salt solution was followed by an improvement of vision.

Treatment of the Grave Syphilitic Ocular Accidents.

DARIER, Paris. (*La Clinique Ophtalmologique*, September 25, 1903) Where syphilitic lesions have resisted other forms of treatment, Darier employs daily increasing intravaneous injections of mercury until toxic symptoms appear

At the end of twelve or fifteen such injections the effect is augmented by subconjunctival injections made every second or third day. To obtain the best results, thirty or forty intravenous and a dozen subcutaneous injections are usually required. The improvement in vision does not follow at once, generally becoming most marked after a period of rest of a month. In order to complete the treatment, the author generally makes a series of injections of pilocarpine about a month after the discontinuance of the mercury; this series should be repeated some two or three times during the year.

A Trial of the Subconjunctival Injections of Twenty-five Per Cent. Strength of Iodipine.

NEUSTATTER, Munich. (*La Clinique Ophtalmologique*, September 25, 1903.) Neustatter has beneficially employed subconjunctival injections of a twenty-five per cent. strength solution of iodipine in a case of high myopia with chorioiditis and vitreous opacities. The deformity resulting from the nonabsorbability of the solution, he says, can be overcome by injecting the drug into the conjunctival cul-de-sac.

Ultramicroscopic Researches on Colored Substances: Psychophysiological Results.

RAEHLMANN. (*La Clinique Ophtalmologique*, September 25, 1903.) Siedentopf of Jena, Raehlmann informs us, has constructed a microscope in which, by means of intense lateral focal illumination particles in the field of observations are apparently rendered luminous. With this instrument, Siedentopf and Zsigmondi have recognized the simple colored nuclei in a red glass, which under the old method appeared uniformly transparent. The author has employed the instrument in the study of colored fluids and has been able to determine the presence of minute particles in their own color. He believes that the method is particularly of value in investigations into the colored substances of solution.

In the mixtures of colored substances, he says, there is first a physiologic combination by which the color of numerous small particles act upon the same point of the retina. In the second place there intervene numerous small particles for the most part ultra-microscopic; the coloring propensities of which the author will describe.

- The color of very small particles shows all the physioo-

physiologic properties of the colors. These particles, he says, form the smallest retinal images which magnification and illumination permit one to perceive. They have an inferior and a superior limit without color, appearing gray under very feeble illumination, and white under a very strong one.

X-ray and Radium in Ocular Therapeutics.

DARIER, Paris. (*La Clinique Ophtalmologique*, September 25, 1903.) Darier reports a case of alveolar sarcoma of the eyelids cured by fifteen seances with the x-ray. Radium, applied externally, he says, is a most powerful analgesic, relieving neuralgia, the pains of rheumatic iritis, traumatic iridocyclitis, etc., as well as the excruciating pain of inoperable cancer.

The same applications may lead to a rapid cleaning of the ocular media. In ointment form the element gives some very curious results in some cases of blepharitis.

Traumatic Paralysis of the Ocular Muscles of Orbital Origin.

DE LAPERSONNE, Paris. (*Recueil d'Ophtalmologie*, August, 1903.) De Lapersonne reports five cases of paralysis of the ocular muscles resulting from contusions about the orbit with penetration of the cutaneous surface. In all, pressure, pain, and diplopia appeared immediately after the accident. The inferior oblique muscle was twice involved; the superior rectus muscle twice; and the inferior rectus muscle once. The pathogenesis is supposed to consist in a hemorrhage into the sheath of the muscle which is involved. In a few cases rupture of the pituitary membrane or of the mucous lining of the maxillary sinus, with a probable fissure of the corresponding orbital wall, has been observed. In all of the cases convalescence was rapid; complete cure being obtained in eight weeks or less time.

On the Value of Adrenaline in Ocular Therapeutics.

YVERT. (*Recueil d'Ophtalmologie*, August, 1903.) Yvert states that adrenaline is quite extensively used by women to increase the brilliancy and "languorous" aspect of their eyes. Therapeutically, the author has found that one drop instillations of a one to one thousand strength solution of adrenaline chloride used three times a day, possesses markedly curative properties in acute catarrhal conjunctivitis, rheu-

matic conjunctivitis, ocular congestion of rheumatic nature, vernal conjunctivitis, scleritis, and episcleritis.

In combination with atropine and cocaine the drug often produces extraordinary effects in the treatment of grave iritis. Associated with eserine, it increases the effect of the latter drug; often with good results. In chronic iridochoroiditis, the drug is also of value; while in a few cases of retinal hemorrhage as well as hemorrhage into the vitreous humor, its use has proved beneficial. The installation of two drops of a one to one thousand strength solution into the eye five minutes before the application of silver or copper, very much lessens the pain which is produced by these agents. In affections of the lacrimal passages, the ducts are rendered much more pervious and less sensitive to the actions of medicaments, by previous injections of adrenaline. By combining the drug with cocain, any field of operation is rendered more anesthetic, while troublesome hemorrhage is usually avoided. Diagnostically the use of the drug is of value in deciding between superficial and deep lesions of an inflammatory nature; the former disappearing under its devascularizing effect.

Chorioidal Sarcoma.

HOUDART, Brest. (*Recueil d'Ophthalmologie*, August, 1903.) Stock, Houdart says, has reported forty-seven to sixty-three per cent. of cures of chorioidal sarcoma treated by operative procedure. Houdart believes these results are too favorable. He reports a case of chorioidal sarcoma in a female of forty-two years of age. The patient suddenly discovered that she was blind in one eye, but did not give any history of pain. Examination revealed a slight edema of the upper eyelid with some chemosis and injection of the globe. The lids were closed poorly and the cornea was slightly excoriated in its lower part. The sclera was normal, and the ocular rotations were unaffected. The anterior chamber was gone and the iris was replaced by a dark mass which rested firmly against the posterior part of the cornea. The globe was slightly enlarged and was very hard.

Enucleation, which at first was refused, was performed, revealing the involvement of optic nerve. Evisceration of the orbit was then proposed and was refused; but was rendered necessary three weeks later by a rapid return of the growth.

There was no local return, the patient dying of an indeterminate malady some several months later.

Microscopic examination of the eyeball revealed the presence of a dense melanosarcoma which had completely destroyed all of the parts within the sclera.

A rapid generalization after the second operation is presumed to have been the result of visceral emboli arising from the local venous thromboses. The author emphasizes the absence of pain in this case because pain and malignancy usually go *pari passu*.

New Method for Regular Tattooing of the Cornea.

ARMAIGNAC, Bordeaux. (*Recueil d'Ophthalmologie*, August, 1903.) Armaignac employs dome shaped shields perforated at the top by circular openings of different diameters. When tattooing a cornea over the pupillary area, a shield with the requisite perforation is placed firmly on the globe and the underlying free space is rapidly tattooed with a four point needle fastened to a holder. By employing a shield with a larger perforation the iris can be similarly outlined.

Anatomical Examination of Ulcer of the Cornea With Hypopyon.

VILLARD, Montpellier. (*Recueil d'Ophthalmologie*, August, 1903.) Corneal ulcer, Villard says, is produced by the disappearance of the anterior epithelium of the membrane of Bowman with a certain degree of thickness of the corneal stroma. The zone of progression of the ulcer is formed by thinned lacerated corneal lamina, between which a great number of small cellular elements originating from the fixed corneal cells, with numerous pneumococci, exist. The membrane of Descemet is intact. The inferior part of the anterior chamber is filled by a large number of polynucleated leucocytes lying in a more or less fine network of fibrin.

This hypopyon also contains some cells of pigment of iridal origin. It does not contain any microorganisms. It arises from the iris, and not from the cornea or from the zone situated about the canal of Schlemm. The iris is infiltrated by polynuclear leucocytes which pass into the anterior chamber through ruptures in the anterior endothelium. The contained pigmented cells are diminished in number and are altered in their structure.

**Anatomical Disposition of the Nasal Canal in the Negro—
Which Explains the Less Predisposition of this Race to
Affections of the Lacrimal Passages.**

SANTOS-FERNANDES, Havana. (*Recueil d'Ophthalmologie*, September, 1903.) Santos-Fernandez concludes that: first, the nasal canal of the white is longer and more tortuous, which explains the greater liability of the white race to affections of the lacrimal passages; secondly, the nasal canal of the negro is wide and rectilinear, which explains why in this race obstructions are less frequent, and why affections of the sac and of the lacrimal canal are rare and in smaller number than in the half breeds or whites.

**The Influence of Temperature and of the Season on Attacks of
Acute Primary Glaucoma.**

STEINDORFF, Berlin. (*Recueil d'Ophthalmologie*, September, 1903.) In a study of acute primary glaucoma, Steindorff finds that in sixty-five the attack occurred during the cold months (from October to March). In sixty-eight, the day on which the attack would take place could be definitely determined; and it was found that on these days the temperature was usually either high or low. It is known, the author says, that temperature influences vascular pressure; cold increasing it, and heat producing the reverse.

Glaucoma, he believes, is more frequent in subjects with scleroses, possibly partly so from the greater difficulty in their ability to readjust the vascular balance to changes of temperature. The winter season, he has found, also predisposes to the condition, because of the less active life which is often lead by the subject; the greater prevalence of certain conditions such as constipation, and coughing; and the shorter and darker days and the long nights—with consequent dilation of the pupils and increase of accommodative efforts through poor illumination with a resultant advance of the lens which presses the iris against the cornea and closes the spaces of Fontana.

The knowledge of the preponderance of glaucoma in the cold season, he says, is of value in teaching us at times how to help to avoid an attack.

**ABSTRACTS FROM DUTCH OPHTHALMIC
LITERATURE.**

BY

E. E. BLAAUW, M. D.,

BUFFALO, N. Y.

ASSISTED BY

D. A. KUYK, M. D.,

RICHMOND, VA.

**Transactions of the Twenty-third Meeting of the Netherlands
Ophthalmic Society at the Hague, June Seventh, Nine-
teen Hundred and Three. Twenty-six Members
Present. Presided Over by Dr. Nicolai. Con-
tinued Report of a Case of Vena Optic
Ciliaris.**

DR. VAN GUENS, continuing his report* of a case of V. optic ciliaris at the 22nd meeting of the Netherlands Ophthalmic Society, Dec. 14, 1902, esteems it worth reporting the existing condition, especially the enlargement of the vein in the right eye which originates from the vena c, r, and extended over the papilla to disappear again at its edge in the depth of the nerve, has become so small as to be invisible.

On March 6th, 1903, the abnormal veins of the left eye were not visible with the ophthalmoscope, while the calibre of the large vena opticus ciliaris of the right eye had reduced one-third. On March 27th, 1903, this vein was invisible. There was found at the immediate examination the following condition: Slight atrophy of the optic nerve on both sides without particular symptoms, vision is somewhat but not much diminished. V. 5/10. Field of vision last month showed

*See Annals of Ophth., 1903, p. 264-5.

nasal hemianopsia with reduction below normal of the temporal field; now there is no distinct hemianopsia of the left eye.

DR. VAN GUENS comments that the sudden formation and likewise sudden disappearance of so-called vena optica ciliaris accounts for the infrequency of recognition of such cases.

Siderosis Bulbi.

DR. HAZENWINKEL. Patient eleven years since was injured by flying splinter of iron, a part of which was removed the following day, he was then kept under observation for two months, fearing sympathetic irritation. Before the injury vision was perfect. After accident visual acuity progressively declined but because the eye gave no other trouble no further treatment was sought.

In 1897, five years after the injury, symptoms of iritis supervened, which, however, responded promptly to appropriate treatment. From 1897, to date, the eye has remained quiescent, free from all irritation, but has now only light perception. T normal. The cornea shows a small linear scar, there is here an anterior synechia, probably the course of the foreign body into the interior of the eye. Scattered about the cornea, deep in its substance, and on its posterior surface, are numerous punctate deposits, some brown in color. What is especially noticeable is the rust brown color of the iris, which is greatly atrophied. Pupil is narrow and does not respond to light stimulus, perhaps, because of posterior synechiae. There is also iridodonesis. Reflected light gives only a slight red reflex. Presence of the lens could not be ascertained. No examination by sideroscope was made, but the clinical picture is so complete that the presence of the iron splinter needs no argument. What is most noticeable is the absence of all inflammatory symptoms, yet the p. l. has reduced to mere perception of light, confirming the truth of the statement of Von Hippel, that nearly all eyes that contain iron in their media after a longer or shorter time become blind.

To what extent the deposits in the cornea are attributable to indirect siderosis, it is not possible to distinguish. According to Von Hippel indirect siderosis of the cornea by partial resorption of iron from the depth of the globe is infrequent, he has recognized but two cases and even these are somewhat doubtful.

BUNGE declares that we should differentiate these cases by

the color of the deposits, the hematogenous pigmentations will produce a yellowish green color; siderosis cornea a brownish red or rusty color. While he does not deny that such may be the case, yet that we may differentiate by the color alone is to him questionable.

Von Hippel attaches much importance to small bloodvessels at the periphery and upon the history, if at the time of the accident there was bleeding, but agrees with Bunge that it is not quite possible to differentiate if the spots are hematogenous or siderosis. The rusty-brown discoloration of the iris is quite surely due to the presence of iron, but he remarks that this discoloration is less frequent than the greenish yellow.

VON HIPPEL observes positively in his report of Eisenburg of the Geissener Clinic that in fourteen cases of siderosis there were twelve greenish yellow to two reddish brown. The iridodonesis is due to resorption of the lens or to fluidity of the vitreous, which Von Hippel in Von Graefe's Archives attributes to the destructive action of iron. The amaurosis is due to retinal involvement.

DR. VAN MOLL remarks that siderosis may occur very quickly and in one case he saw it occur four months after a perforating wound from a small sliver of iron.

Case of Conical Papilla Nervi Optici.

DR. FABER has observed cases of alteration in the form of the papilla which he calls conical papilla because of its resemblance to conical cornea. The condition of the optic nerve is diametrically opposite to that of the excavated papilla and usually involves the entire nerve head; the apex is usually central but is sometimes eccentric. In some cases it was noticed that the apex was flattened and slightly depressed. Just as the excavated nerve is recognized by the bending backward of the blood vessels so is the conical optic nerve recognized by the bending forward of the arteries and veins. The color of the papilla may be normal or slightly reddened or may even be paler than normal. The height of the papilla correspond to the refraction, vary ing from .25 to 1 dioptre.

During the last three years he has observed forty cases of more or less conical papilla. (He reported a number of cases

minutely detailing height of the papilla and the refraction of the eye.)

He closes his report by stating that while the object of this report is to stimulate further observation in this direction yet he feels that he does not venture too far in presenting two propositions, first; that conical enlargement of the papilla does not necessarily exist with disordered function; second, that degenerative processes in the optic nerve may cause conical papilla,

Discussion.

DR. ROCHAT asks if there is a physiologic excavation?

DR. PIEKEMA asks if the tension is normal?

DR. NICOLAI asks if the accommodation amplitude had been determined?

DR. DEVRIES asks if the condition is to be considered pathological?

DR. FABER.—The typical cases showed no excavation, but a slight pitting at the apex might be considered as a physiologic excavation. The tension was normal. The accommodation amplitude was not determined. He considers the condition pathologic but would not at this time express himself concerning its significance. In reply to Dr. Waller Zeper he occasionally observed a partial enlargement of the O. N. Most cases have remained stationary.

Light Stimuli and Retinal Currents in Their Quantitative Connection. (Illustrated.)

DEHAAS, H. K., was made doctor cum laude on this dissertation. A historical survey and description of the ways, in which the experiments were made, precede.

The difference in potential between two places of the eye becomes greater, the more the one place is nearer the cornea and the other nearer the cross-section of the optic nerve (current of rest). The bulbi were separated from the muscular tissue and examined in daylight. During the experiment the current of rest decreased quickly in the beginning and then more slowly. It did not turn or only long time after finishing the experiments, so that eyes examined 24, 33 and 40 hours after extirpation showed a manifest rest-current in the normal direction.

The action-current also is stronger with the same excitant

in proportion to the one electrode being nearer the cornea, the other one being nearer the cross-section of the optic nerve. The strongest current is produced after the optic nerve is cut and the one electrode is placed on the lamina cribrosa. The action-current of the nerve itself is shown while connecting the cross-section and the nerve-sheath and is opposite to the bulbar current (Kuehne and Steiner).

Sudden darkening of the eye is an irritation which acts in same sense as sudden illumination, although very much more weakly. The results of Kuehne, Steiner and Waller on the direction of the action-current were entirely corroborated. After a momentous illumination of the eye the galvanometer-mirror makes a slow movement, regularly increasing in velocity. After some seconds this velocity decreases and slowly comes to rest to return to the O-point. During the increase in the velocity of the mirror a photo-electrical reaction must be present, this must have lasted some full seconds. Even with stronger momentous stimuli could be demonstrated photo-electrical reaction of at least 30 sec. This same reaction, which lasted often 15 sec., was formed with the isolated retina; entirely in opposition with Fuchs, who found the time of the photo-electric reaction to be 0,0230 to 0,0241 sec. The way, whereon Fuchs measures, is very compound.

Taking a rotating-disc with black and white sectors, we have the law of Talbot: $i = Ix \frac{w}{w+z}$ in which I = the clearness of the white sectors; i = the apparent clearness of the disc; and w/z = the relation of the size of the white to the black (z) sectors.

This phenomenon is independent of the absolute light power and the absolute size of the sectors, as also of the rotation velocity of the disc, if only the alternation of white and black happens quickly enough, so that one white and one black sector together are turned past an unmovable radius within 0,04 sec.

We deduct that the intensity of the sensation with a short excitation time is entirely determined by the energy of the light stimulus. Control experiments were only done with light stimuli, just strong enough to provoke a sensation. DeHaas experimented with stronger stimuli and found the sensations require the same intensity every time, when the

product $I \times t$ is the same, in which I = the intensity and t means the duration of the light stimulus, while the product $I t$ is the measure of the exciting energy. A stimulus coming within the time in which this rule governs, is a "moment-stimulus," the illumination of this time "moment-illumination." This same law holds good for the photo-electric reaction of the frog eye (the retinal current was lead off from the corneal margin and the backwall of the isolated bulb). With a shorter illumination than 8 sec. the effect is determined only by the total light energy. Does the illumination last 12 seconds or longer, then we can speak no more of "moment-illumination." This is not an absolute quantity, but depends upon the circumstances under which the illumination takes place.

A sudden short lasting interruption of a continuous light acts in the same way as exciter, only much weaker.

The influence of adaptation on the photo-electric reaction of the isolated frog bulb is easily demonstrated. A light stimulus of 0, 1 sec., which produces a strong action current in an eye held a long time in the dark, shows only a small effect after the eye has been adapted to the light. In the development of the action current no specific adaptation of special fatigue exists for light of a certain color as red, green or blue or w.-o.-w. The frog eye is unable, so far as action currents can demonstrate, to distinguish colors.

Dewar and McKendrick conclude that the photo-electric reaction of the frog eye does not increase proportionate with the stimulus, but rather follows Fechner's law.

In trying to find a connection between the intensity of the exciter and intensity of the reaction, it is important to illuminate homogeneously the explored part of the retina.

Waller experimented with stimuli, which increases arithmetically, while he observed that the intensities of the reaction did not increase accordingly.

After Langley the light intensity, which the human eye can perceive, bears a proportion to the intensity which the eye can tolerate as $1:10^{15}$. A relation $1:2 \times 10^{13}$ seems better, or $1:4 \times 10^{12}$, taking the relation of the direct sunlight to that of the still just observed star (Pickering). These numbers might not be as big, still they are of the same order for the frog eye so that Waller's curves only are one million of million's part of the curve, thought-completed.

DeHaas could use stimuli, the intensity of which varied from one to ten million. Out of many experiments DeHaas, constructed a curve, using as ordinates the electromotor forces of the photo-electric reactions, as abscises the logarithms of the intensities of the stimuli. This curve if entirely developed would have a shape. If Fechner's law would be found here, the curve ought to be a straight, slanting (/) line; the deviation is very manifest with weak light-stimuli, while the line becomes nearly straight with stronger exciters and if we could use much stronger stimuli a curve, concave downward, would appear. In all probability a certain intensity of stimulation will exist, which produces a maximum of photo-electric reaction.

Supposing that the intensities of the perception are proportionate with the intensities of the photo-electric reaction then those deviations of Fechner's law give us sufficient light sensations, with much larger variation of the light intensity, than otherwise would be the case. The absolute light intensity being small the intensity of the sensation will only decrease little more with continued decrement. If the absolute light intensity is very large, then the intensity of the sensation will only increase a little more with continued growth. Therefore small variations in the light intensity will be perceived with more difficulty at the limits of the absolute intensities.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

ALBERT B. HALE, M. D.,

CHICAGO, ILL.

Anesthetic Ulcers of the Cornea.

ALONSO, San Luis Potosi. (*Anales de Optalmologia*, August, 1903.) After referring to the experiments of Magendie and Claude Bernard, on the results of anesthesia of the cornea, examines the conditions underlying neuro-paralytic keratitis, and affirms that similar but milder inflammations are often apt to be noticed on the cornea in connection with disturbances of the nerves of sensation. The ordinary treatment seems useless or harmful, and Alonso agrees with Panas that a blepharorrhaphy is the best protection. He reports a case of typical progress in which all methods seemed ineffectual, until he sewed the lids together, leaving a very small opening through which applications could be made. A cure resulted in 15 days.

Present State of Antisepsis and Asepsis in Ocular Surgery.

SILVA, Mexico (*Anales de Optalmologia*, September, 1903), discusses the history of antisepsis, and states that we must adhere to this method, as pure asepsis about the eye is impossible. He advocates four steps: (1) Use of chemical antiseptics; (2) Sterilization of instruments; (3) Sterilization of all materials and solutions; (4) Preparation of surgeon and patient.

For (1) he uses solutions of sodium bichloride 5:1000 with cyanide of mercury 1:1500 or 1:2500.

For (2) he uses a soapy bath of cyanide of mercury, a brush, absolute alcohol followed by heat for ten minutes in Schimmelbusch apparatus with normal salt solution, or

dry heat in Pean's apparatus 160° to 170° (C) for one hour.

For (3) he uses vapor under pressure.

For (4) he has the surgeon prepare, as for any major operation, sterile linen jacket, gauze headdress, hand scrubbing in hot water and soap and a solution of cyanide of mercury. He praises the permanganate of potash (10:100) and bisulphite of soda method. He rejects the preliminary occlusive bandage for the patient, but uses a general bath, followed by soap bath (cyanide of mercury) to face, brows and lashes, and final irrigation. The lacrimal passages are tested for patency, with a dry bandage to test the conjunctiva as to secretion. At the time of operation a rubber cap is used. All but the field of operation is covered by sterile gauze.

New Model of an Artificial Eye for Skiascopy.

TRONCOSO, Uribe, Mexico, (*Anales de Optalmologia*, September, 1903.) illustrates his new model, consisting of two cylinders one within the other, the inner one holding at its back a colored picture of the fundus. The outer cylinder represents the anterior aspect of the globe and has 10 mm. opening for a pupil. Around its periphery are marked degrees 0° to 180°. There is an opening on top through which the rays of light from the mirror may be observed. In front of the pupil are spaces for lenses.

Composition of Aqueous Humor in Cases of Senile Cataract.

TRONCOSO, Uribe, Mexico (*Anales de Optalmologia*, September, 1903), presents an elaborate study of ten cases where he analyzed the aqueous and came to the following conclusions:

1. The quantity of albumin is not increased in the aqueous during cataract formation.
2. In incipient nuclear cataract the saline constituents are increased; not so in incipient cortical cataract.
3. Toward the period of maturity, the aqueous seems about normal.
4. In overripe cataract there is an increase in the proportion of organic material in the aqueous.
5. There are two distinct physical periods during the formation of cataract, one of absorption of water (and swelling), one of loss of water and contraction; but it cannot be

admitted that the increase in the quantity of salts causes opacification.

6. This increase in proportion of salines in incipient cataract encourages the belief that during the period of initial cataract there is a subtraction of water, a drying of the nucleus, and as this contracts, the changes in the perinuclear zone begin.

Optical Treatment of Myopia.

ABARCA, Guadalajara (*Anales de Ophthalmologia*, September, 1903), comes to the following conclusions:

1. An incomplete correction of myopia is the best.
2. The fundus must be constantly examined and hygienic conditions demanded.
3. Retinal circulation must be encouraged.

Elephantiasis Palpebralis Developed From a Phlegmasia Due to Recurrent Facial Erysipelas.

FARRERAS, Barcelona, (*Archives de Optalmologia*, September, 1903), gives an extensive literature and analyzes a case of his own. The patient, a soldier, 30 years old, had over a hundred attacks of profound facial erysipelas since his seventh year, sometimes four a month. His face was now myxedematous, his lids, especially the lower, were enormous but painless and pitted, his lips, cheeks, neck, and nose were fleshy. Sensibility normal. On rising, the lids were larger than on going to bed. There was at times conjunctival chemosis. The eyes themselves were normal. The body was healthy. At eight he had scarlet fever and measles. He was finally dismissed as unfit for service.

There seems to have been produced diffuse hyperplasia of the lids; the microscopic examination usually showed modifications in the forms of the cells of the Malpighian bodies, which are fuller of pigment; there are abundant embryonic cells, with increased lymphatics and blood vessels.

Treatment seems deficient, but operation may help, or the galvanic current, or electrolysis.

Delirium After Operations of the Eyeball.

SANTOS, FERNANDEZ, Havana (*Archives de Optalmologia*, October, 1903), reports two cases of delirium, but he rejects, for his own satisfaction, all other causes and accepts

as explaining his cases the deprivation of alcohol; but he has seen delirium occur only after cataract operations.

A New Method for the Surgical Treatment of Cicatricial Ectropium.

RIVERO, Buenos Ayres. (*Archives de Optalmologia*, October, 1903.) La Gleyze's method has been somewhat modified by the author. The patient was a male, 31 years old, who when two years old burnt his cheek, producing a cicatricial ectropium of the lower lid. The operation was as follows: An incision parallel to and 2 mm., from the ciliary edge was made from internal to external angle; adhesions were then broken till the lid returned to its normal position, leaving the lips of the wound gaping at least a centimeter. A second incision was then made, one centimeter and a half below the first and parallel to it, the bridge of skin between was cut by an oblique incision through the middle third. The upper flap was then stitched to the inner angle, the lower flap to the entire angle. Coaptation should be exact and carefully maintained. Tarsorrhaphy was not performed.

ABSTRACTS FROM JAPANESE OPHTHALMIC LITERATURE.

BY

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TOKIO, JAPAN.

TRANSLATED FROM GERMAN MS. BY H. V. WÜRDEMANN,
M. D.,

MILWAUKEE, WIS.

Syphilis of the Orbit.

KOMOTO. PROF. (*Nihon-Gankwa-Gakkwai-Zasshi*, V. VII, No. 5.) CASE 1. A 29 year old woman came in May, 1901, with edema of the right eye lids and pain in the eyeball. The edema shortly spread over the entire right side of the face, and the eyeball seemed to protrude a little. These symptoms disappeared in a short time under treatment, but returned again, so that the patient was subjected to an enucleation of the affected eye. Four months later pain occurred in the empty orbit. November 2, 1902, she had a sore on the end of the nose and upper lip. The lids of the right side were somewhat swollen. A tumor, which felt like cartilage, was found in the substance of the lower lid, but it was not tender, although pain was felt there at intervals, usually greater at night. On the lower half of the right malar bone could be found a second tumor of a similar character, which was freely movable and not connected with the skin. The ulcer of the tip of the nose and upper lid had slightly infiltrated edges and was covered with thick crusts. An ulcer covered with yellow pus, with somewhat undermined and slightly infiltrated edges, was found in the middle of the hard palate. The left eye is entirely healthy

Although lues was denied and no syphilitic lesions were found

upon the body, Komoto considered this to be a specific disease and ordered iodide of potash 1.0 pro die and unguentum cinereum. After a week three new ulcers appeared upon the under lid, and another new one on the end of the tongue. After this many ecchymoses and indurations appeared in the extremities. As these conditions became worse, the author, according to the advise of Prof. Dohis, changed the treatment to inunctions of mercury. The symptoms rapidly improved, so that on December 11th the patient was entirely healed. After this the author tried iodide of potash upon the patient twice, and each time observed that she became worse, as at first.

CASE 2. A girl, aged 17, came February 2, 1903, stating that for about two weeks she had a swelling of the upper right eye lid. Lues was denied. There were no enlarged lymph glands. The right lid was edematous and the bulbar conjunctiva greatly chemotic. A tumor of the size of a chestnut could be felt in the lower lid; this was tender to the touch, somewhat hard, and slightly movable; it was attached to the lower wall of the orbit and moved with the eyeball; the bulbus protruded outward, upward and toward the nasal side. The excursions of the eyeball in all directions were decidedly lessened. There were several old maculae of the cornea. Vision = fingers at 1.5 m. (left = 20/20). The treatment consisted in internal administration of pil. hydrargyri salicylici, and inunctions of mercury. After a week the tumor was found much smaller, the movements of the eyeball improved, and the edema of the conjunctiva almost entirely gone; the visual acuity, however, did not improve.

The above two described cases are the last ones seen out of a series of seven cases. The chronic form of specific periostitis in the depths of the orbit usually shows an orbital tumor. When it is connected with protrusion of the bulb and decided paralysis of the muscles, a diagnosis may surely be made of periostitis in the neighborhood of the superior orbital fissure. It is often difficult to differentiate the acute form, which is accompanied by redness and swelling of the lids and conjunctiva, from orbital phlegmon or from a malignant tumor. The author remembers an 18 year old hussy who showed protrusion of the eyeball with considerable external inflammatory symptoms, who had been advised by a doctor to have the eyeball taken out, but who was cured by anti-

luetic treatment. Many authors are doubtful if true gumma of the orbital cellular tissues occurs. Although in the second of the above described cases there were no syphilitic lesions on the body, the author considers that the prompt cure of the case showed it to be of a specific nature and that it was a typical case of orbital gumma, especially as the tumor in the depths of the under lid was freely movable over the edge of the orbit and could not be considered in any way a periosteal swelling. Six of the seven cases were women.

Syphilis of the orbit seems to be both acquired and congenital. The second case belonged to the latter, the patient being a young virgin of good family, and in whom acquired syphilis could not be entertained. Of especial remark was the unfavorable action of iodide of potash in the first case. On account of these experiences, the author considers mercury to be applicable in all stages of syphilis.

A Case of Paralysis of the Accommodation Caused by Excessive Cohabitation.

KANADA, T. (*Okayama-Igakkwai-Zasshi*, N. 161.) A strong, healthy, unmarried man, aged 25, consulted the author complaining that since morning he had a pressure in the eyes and could not see well in the near. He also had general body weakness. Examination of both eyes showed the tarsal and scleral conjunctiva somewhat injected, but no secretion. The pupils were about 6 mm., wide and reacted slowly. The media and fundus were normal. Vision = 6/VI. The near point lay at 35 cm. from the eyes. There was photophobia and micropsia; objects seemed surrounded with a glistening brownish aura. The author made diagnosis of paralysis of the accommodation, and after close questioning, to his great astonishment, found the following: During the last two days the patient had gone in a carouse with an accommodating girl, and had cohabited with her 8 times during the previous night of 9 hours, and 5 times during the day after within 5 hours. In 2 of the 13 performances ejaculation did not take place. Although more than satiated with his experience, he went afoot to his home about 16 kilometers away, discovering loss of vision the following morning. Kanada, instilled eserine in both eyes, recommended rest and diet; the conditions passed away after three days.

Pseudo-Actinomycosis of the Tear Ducts.

OGUCHI, T. (*Chugwai-Iji-Shimpo*, N. 559.) The aut or found in a 35 year old woman swelling and hyperemia in the neighborhood of the left lower canaliculus, which was attended by enlargement of the puncta lacrimalis and contained a grayish-yellow hard granule; no ulceration of the walls of the canal was found. The inflammatory symptoms disappeared almost entirely after three days. The concrement was yellowish brown and about 0,5 mm. in thickness. Under the microscope it was seen to be formed of convolutions of branching threads which radiated to the periphery. This appearance looked very much like actinomycosis, but the characteristic club like ends were wanting in the peripheral zone, although the club ends were found in the inner portion of the thread construction. On account of the relatively innocuous character of the mould, the author calls this growth a "pseudo-aktimyces." For the microscopic examination he stained the mycotic threads with Wygert's modification of Gram's method, and with carbol-Fuchsin or picric acid. In these cases segmentation was not found, and the characteristic staining of the spores was likewise negative. The author has found similar appearances in the case of *leptothrix buccalis*.

The Poisonous Effect of Violet Lead Pencil Upon the Cornea.

KUROKAWA, B. (*Nihon-Gankwa-Gankkwai-Zasshi*, V. VII, N. 6.) A school boy, aged 16, struck his right eye with the end of a violet lead pencil. Immediately afterward he had photophobia and lacrimation, the tears being colored violet for several hours. As the irritation did not subside, the boy came four days later to the author. There was then great swelling of the lids, chemosis and blennorrhea. The case proceeded to the formation of large ulceration of the cornea, which perforated later and staphyloma ensued. In order to prove that the substance from the violet lead pencil caused the ulcer of the cornea, the author made a solution, and also a powder, of this substance, and put it in the eyes [of a Guinea pig, and in the course of some days purulent keratitis came on. In another Guinea pig, used for control, the powder from an ordinary lead pencil only produced infiltration of the cornea. On account of this experiment the author

thinks that the violet lead pencil produced a corrosive effect upon the cornea.

Cysts Developing Under the Epithelium of the Ciliary Processes.

CHIBA, K. (*ibidem*). In microscopically examining the eyes of a 23 year old man, who had died from leukemia, the author found the following hitherto unknown changes: Upon the under surface of the ciliary body of both eyes there were numerous round and oval cysts of varying size, which were mostly between the pigmented and non-pigmented epithelium. A few of these cysts were found within pigment epithelium, which were spread out in two layers. The contents of these cysts, stained lightly by eosin, looked like fibrin, but could not be distinguished between fibrin and mucin. This case was in a young person who did not show any evidences of atrophy or of inflammation of the ciliary body. The anterior chamber had not been punctured. The author thinks that this case is a symptom of edema from the leukemia.

**Upon a Hitherto not Described Tumor of the Orbit,
(Fibromyoma Lacri-Cellulare).**

MIZNO, G. (*Nihon-Gankwa-Gakkwai-Zasshi*, V. VII. No. 8.) A 25 year old woman came to the author, stating that left sided exophthalmos first developed in her at 17 years, which at first was slight, but during the last two years had grown rapidly, and that during the previous year there had been keratitis from the lagophthalmus.

Status praesens: The left eye extrudes and is pushed toward the nose; the movements outward and downward are somewhat hindered; vision=20/100; the visual field slightly concentrically contracted. A movable tumor could be distinguished through the skin of the outer portion of the lids in the depths of the orbit, being covered more by the upper lid, and on the under side feeling more round and harder. There is no evidence of syphilis on the body. Prof. Komoto made an operation after Krönlein and took out five separate tumors. These were oval, ball like, or kidney shape, and were situated in the connective tissue, being covered with an easily movable capsule. The largest of these tumors was situated in the posterior portion of the orbit, one was grow-

ing to the optic nerve, one was attached to the outer portion of the muscle sheath, and the other two were under the skin of the lids. The after history was as follows:

On the third day the sight was entirely lost, so much so that the patient could not distinguish light and darkness. On the next day the sight returned so that she could count fingers at 6 m. The color sense, however, did not return. Seventeen days after the operation the epithelium of a portion of the cornea came off with some infiltration, but this gradually passed away. The largest of these growths measured $40 \times 20 \times 15$ mm., and the smallest, $17 \times 15 \times 5$ mm. When the capsule of the growths was removed, the external surface of the tumor appeared yellowish gray, and the same on section, and formed in layers. Microscopic examination showed many small rings which were surrounded with a connective tissue containing a few, relatively, somewhat curling blood vessels. The layer itself was composed of bundles of long cells with thin nuclei. The appearance was so typical that a diagnosis of fibromyoma seemed positive, which, however, was remarkable as occurring in such an unusual locality. The diagnosis was to be made between a simple fibroma and a neuro fibroma. The formation of this new growth is certainly not clear as to whether it arose from the vessel walls. The author thinks that the larger tumor arose from the Mueller's orbital muscle, and that the other four developed from muscular tissue, which was congenital in the orbit.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

CASEY A. WOOD, M. D., D. C. L.,

CHICAGO.

Recent Experiments to Determine the Causes of Nystagmus.

TROMBETTA AND OSTINO (*Annali di Ottalmologia*, XXXII, Fasc. 9-10, 1903, p. 694) remark that otologists have long known that nystagmus sometimes develops as a result of caries of the middle ear, especially if located on the wall of the tympanum toward the labyrinth. Neither have the oscillating movements of the eyeballs escaped the attention of the physiologist (Cyon, Baginsky, Sewall, Gellè Hoygies and others) in their experiments on the semicircular canals.

Trombetta and Ostino describe their experiments with two dogs and analyze some clinical histories published by other writers, from which they conclude that the experimental and clinical facts observed establish a close connection between the movements of the eyeball and the vestibular nerve. They accept as most plausible Ewald's theory that in the labyrinth there exists a center for movements in general and for those of the eyes in particular. This assumption harmonizes with the views previously announced by them as also with the results of Stein's experiments. The latter assumes however, that this influence from the labyrinth is restricted to the more delicate muscular movements.

The fact that abnormal movements of the eyes follow excitation of the semicircular canals and disappear at once after removal of the latter, confirms what Hoygies has already demonstrated by another method, namely, that the ocular muscles are maintained in a condition of tonic innervation by a reflex excitation, emanating from the labyrinth. The

nystagmus is a disturbance in the innervation of the ocular muscles induced by some abnormal reflex stimulation of the ampullæ of the semicircular canals. Their researches establish this point beyond the question of a doubt. The cessation of the nystagmus after the extirpation of the canals is due to the fact, they believe, that owing to the resultant lack of the centripetal routes for the transmission of the motor impulses to the muscles of the eyes, the latter are no longer influenced in their movements except in their finer and more delicate phases, and these motor changes cannot be studied on the dog.

The writers conclude that experimental and clinical facts prove the correlation between ocular movements and the vestibular nerve. The opinion of Ewald (*Physiol. Untersuchungen über das Endorgan des Nervus Octavus*, Wiesbaden, 1892) that in the labyrinth there exists a tonic center for movements in general, and for those of the eyes in particular appears to them the most probable, and to be in accord with what was announced by one of them in a preceding work. It is also in accord with the results of experiments by Stanislaus von Stein (*Die Centrifuge bei Ohrenleiden*) who believed this labyrinthine tone to be limited to the finer muscular movements.

According to Hoygies the ocular muscles are maintained in a condition of tonic innervation by means of a reflex excitation, the point of departure of which is in the labyrinth; nystagmus is, consequently, a disturbance of the muscular innervations produced by an anomalous reflex excitation of the ampullæ of the semicircular canals.

Exsection of the Tarsus in the Treatment of the Palpebral Form of Spring Catarrh.

MAGNANI, C., Smyrna (*La Clinica Oculistica*, October, 1903, p. 1460), describes the operation which he advises in these cases: After the skin and conjunctival sac have been disinfected and the patient is under the influence of chloroform, or local anesthesia has been obtained by injecting an anesthetic between the obicularis and the tarsal plate, he everts the upper lid. An assistant keeps it stretched by means of a Jaeger lid holder between skin and skin, with traction on the free margin of the lid with forceps. The tarsus is then incised with a bistoury through its entire thickness

and length to the point where the granulations commence, keeping the incision about 3 mm. from the free margin of the tarsus, and a little slanting, so as to cut as little as possible of the surface nearest the orbicularis, thus ensuring retention of more of the tarsal plate, as the base of the granulation is smaller than their external surface. Then raising the edge of the flap with forceps, he detached the orbicularis with the bistoury held very flat, carrying the instrument to the limits of the granulations which corresponded to the point of insertion of Müller's muscle. He then separated the levator fascia, which blends with the orbicularis from those that blend with Müller's muscle, using for the purpose closed scissors and working from right to left. This produced a flap of muscle and mucosa long enough so that it could be drawn down to cover the defect and four suture threads were passed through it, 4 to 5 mm. apart. The needles emerged on the side toward the orbicularis. This flap was then replaced and the needles were passed through the new margin of the tarsus, made by the incision and still attached to the orbicularis, passing thence toward the conjunctival aspect, stitch by stitch, each exactly opposite, to avoid traction, either to right or left.

As a still further precaution against ptosis he raised the flap, separated the two middle threads, and then passed another thread, with a needle on each end, through the deepest part of Müller's muscle, about 3 mm. from its center, in respect to the canthi. One needle was passed horizontally for about 6 mm. through the thickness of the muscle, bringing it out at a point corresponding to its point of entrance. The second needle was inserted in the same way and both were brought out on the skin side, close to the lashes, keeping the same distance between them throughout. The threads being thus accurately placed, he drew down and excised the flap of the tarsus, cutting it about 1 mm. above the four suture threads that had been passed through its still adherent portion. The threads were then tied and cut off about 2 cm. above the knots, to facilitate their removal later. The lid was then replaced; the two outer threads were tied over beads and a bandage applied to cover both eyes.

The patient was kept in bed for three days on a light diet. The threads were removed the fifth day and healing was complete without ptosis or interference with the closing of the lids.

The patient whose case he describes in full was a man of 25, who had suffered for seven years from a severe form of spring catarrh and had been treated by every known remedy, without any appreciable results. His improvement after the operation above described, performed in June, was so complete, that if it were not for a few trifling granulations on the lower lid, he might be considered entirely cured. The left eye was operated on two weeks after the right, and both at the time of writing (a month after the last operation), seem to be in perfect condition, with no trace of recurrence. There is a slight hyperemia on awakening in the morning, but before the eyes have been open for an hour, it has passed away. The manifestations of the affection on the lower lid are so insignificant that operation is not needed. If it had been necessary, Magnani proposed to incise the granulating portion obliquely, drawing up the sound conjunctiva of the sac according to suggestions of Kuhnt, from whom Magnani derived the idea of his operation.

The successful results in the case described impel him to publish the method, as the pericorneal form of the affection predominates where he is practicing and it may be long before he encounters another of the tarsal form. Some colleague may be encouraged by his experience to try this method of relief for appropriate cases. The mutilation of so large a part of the frame work of the lid and the partial removal of the Meibomian glands should not deter one from the operation, when it is a question of relieving some unfortunate from such a serious and distressing disease. In the first place we must remember that by this technic we do not remove all the tarsal plate, and in the second place, more or less atrophy of the tarsus is inevitable, even after spontaneous healing. The textbooks state that the affection heals in time without leaving a trace, but Magnani does not accept this statement as correct. Even if the macroscopic findings are apparently normal, we know that the tissues will be found more or less altered under the microscope, especially if we take into account the effect of the numerous cauterizations and other therapeutic measures applied so extensively in such cases. He concludes by suggesting that the mixed forms might possibly derive the same benefit from this procedure as the purely tarsal forms, as the symptoms seem to be directly proportionate to the extension of the process. The im-

provement would not be so marked as in the purely tarsal forms, but everything tends to show that substantial relief might be obtained.

Hypopyon Keratitis in Man and Animals Due to the Bacillus Mucosus Ozenae.

BASSO, Genoa (*La Clinica Oculistica*, October, 1903, p. 1449), concludes after experiments on rabbits and examination of the exudates in human hypopyon keratitis, that the Löwenberg-Abel diplobacillus may locate in the eye of persons affected with ozena and induce there extremely serious inflammatory processes, such as hypopyon keratitis. Ozena, therefore, constitutes a real peril for the eye. It is still unsettled as to whether the infection from the nose travels by way of the lacrimal duct, but the [evidence points to this route. In a case carefully examined by the author the duct was involved in the morbid process, and the lesion in the cornea corresponded to it. In all cases in which ozena is complicated by an affection of the lacrimal passages this mode of transmission is most probable.

Abnormal Color Perception in a Young Woman Operated on for Cataract.

MAGGI, FRANCESCO, Pisa (*Archivio di Ottalmologia*, XI., Fasc. 3-4, p. 86, 1903), gives the following history: A woman, aged 25, was admitted to the clinic August 24, 1902. Nothing abnormal in the general condition. At the age of nine months her left eye had been injured with a pin and since that time vision had been reduced to mere perception of light. Some years ago a squint operation had been done, but without satisfactory results. When she entered the clinic August 24, 1902, vision in the right eye was 5/7.50; fundus normal and perception of colors normal. In the left eye vision practically zero, slight divergent strabismus, nystagmus, and circumscribed anterior synechia near the nasal margin of the pupil, forming an ellipse, with the longest diameter horizontal.

Traumatic cataract. Light perception was good, color perception entirely absent. Synechiectomy was successfully done on August 27, and September 10 the cataract was extracted by the linear method. The lens easily shelled out. It was atrophied and reduced to a small, hard, yellowish nucleus. Recovery proceeded normally. Twelve days

later, when the bandage was discarded, light perception was good, vitreous transparent, the papilla decidedly pink only a trifle] less so than normal, its margins not very marked. September 25, fingers were counted at half a meter, but there was no color perception beyond distinguishing between black and white. This was satisfactory, considering the shortness of the interval, and Maggi proceeded to educate the eye, as it showed that it was capable of functioning. With a + 11 D. sphere vision was $3/40$ on September 27, and the outlines of objects were easily distinguished. At this date there was some improvement in color perception, but the colors were perceived wrong. Red was seen as green, and green as pink, while yellow was seen as a very light green, approaching yellow. The spectrum from an artificial light was perceived as a whitish band. The visual field was much restricted; the angle alpha equaled — 10. The patient was encouraged by the results obtained and continued the training exercises herself. September 28 the spectrum was seen as a bright grey band with stripes in it corresponding to the various shades of the colors composing it. By the 29th visual acuity had improved to $5/50$, and by October 2 color perception had further improved, but was still abnormal, as red was seen as green, green as pink and blue as a brilliant pink, tending to red. October 3, green was distinguished tentatively for the first time. October 6, vision was $5/40$, but the color perception had not improved. The patient was finally persuaded to allow her right eye to be bandaged, so as to exercise the left eye all the time, and the benefits were soon apparent. By October 12, vision was $5/30$, the visual field had increased, and, besides green, the patient was able to distinguish gray. October 15, the spectrum was perceived in three colors, pink, green and yellow, but the colors were inverted; green was seen in the place of the red, pink in place of the green, and yellow in the place of violet. At a distance of 40 cm. the No. 9 letters on a DeWecker and Masselon test-type card could be read.

Red was always perceived as green and green as pink; all the light colors, especially those tending to yellow, were perceived fairly well. Three times out of five violet was mistakenly perceived. Requested to pick out the green skein of yarn, the patient would select the red, and vice versa. October 20 the angle was still — 10, but the field of vision

had increased. Yellow was distinguished well, green and violet with some hesitancy, and red was seen as green. October 24, all the colors of undecided tint were readily recognized, as, for example, the perception of pure green was still defective, but pea-green could be distinguished. Vision 5/20. October 31, the Javal and Schiotz ophthalmometer showed astigmatism against the rule of 2 D. The fundus of the eye had cleared up considerably; the edges of the papilla were well defined. With a + 16 D. lens the patient could read No. 6 line on the De Wecker and Masselon type card. No improvement in color perception. November 3, the angle was — 5. The spectrum was seen as three colors, bright pink, greenish yellow and a green merging to blue, but always in inverted order. The lighter colors were perceived well, yellow fairly, pink not so well. Most of the time green was seen with yellow reflections. Without glasses movements of the hand could be distinguished at six feet. The visual field had enlarged. The patient then left the clinic, and when seen again, December 5, the conditions were identical. She had not continued the eye exercises systematically during the interval.

A review of the literature on the subject shows that from 1700 to the present day operations on the adult for congenital cataract have been numerous. As a rule, persons with this form of cataract have fairly good color sense, but the form sense is defective. This has been mentioned by nearly all the writers (Cheselden, Ware, Hippel, Klein, Paoli, Dor, Martin and Albertotti, Trombetta and others). Maggi's experience in another case has also confirmed this. The latter patient was a boy operated on by Manfredi for congenital cataract in both eyes. He perceived colors well, but did not recognize the shape of objects presented to him. This is logical as, if there are no serious lesions in the fundus of the eye, the subject with a cataract is able to distinguish within certain limits the intensity of the light and of colors, but on account of the opacity of the lens it is impossible for him to distinguish the shape of objects. When this obstacle is removed, the person seeing clearly for the first time with a normal eye, capable of functioning, is unable to use it as he is not accustomed to see with it, and he is incapable of interpreting the visual sensations which his eyes receive. His case is like that of a new born infant, as Albertotti has remarked,

with the difference that in the operated subject the intelligence has been developed and hastens the interpretation of the visual sensations. In the case described in this communication, on the contrary, the form sense was perfect while the color sense was defective, and this fact distinguishes this case from all others hitherto published in literature. It is true that the patient had been blind in only one eye during the twenty-five years, and the sight of the other eye was an aid to the interpretation of the visual sensations received by the eye operated on, since she had already been educated to distinguish the shapes of objects and colors, and hence did not require the long and patient training to teach her how to interpret her own visual sensations—while in almost all the other cases related in the literature this training had been necessary.

The integrity of the color sense in the normal eye, with the intelligent co-operation of the patient, rendered the phenomenon still more conspicuous and served to control the deficiencies and errors in the color perception, showing up even the minor differences. The fact that the patient had one normal eye suggests, of course, that the correct perception of the shapes of objects was due to her being already accustomed and educated to perceive and interpret her own visual sensation, but why was this not the case, also in regard to colors? Color blindness and difficulty in distinguishing colors are always binocular, and Maggi knows of only a few instances that have been published in which these anomalies were limited to a single eye, and in these cases there was always some pathologic change in the fundus or central nervous system, especially in cases of complete color blindness. Quaglino, among others, refers to a case consecutive upon left hemiplegia. The phenomena observed in the present case cannot be attributed to variations in the intensity of the illumination or of the tints and shades, as the color perception with the normal eye in the Holmgren-skein test was always perfect. The complete color blindness noted in the first days after the operation was undoubtedly due to lack of training in the eye, both for visual sensations in general and for color perception in particular, but how is the abnormal perception of the colors to be explained. When the sight is defective from refraction anomalies, the color perception remains intact, even when the shapes of objects are not well

appreciated. We also know that acquired color blindness depends always on some affection of the apparatus for visual perception, from the retina up to the central visual centers, and that in such cases the color blindness does not come on suddenly but is gradual, commencing with the loss of perception of green and red, then yellow and finally blue. In the case described, there was nothing in the eye findings nor in the history of the case to suggest any brain trouble or any cause for this difference between the two eyes, hence the abnormal condition cannot be designated as dyschromatopsia. Another point to be borne in mind is that there was no color perception at all at first, and it did not develop until after the eyes had been exercised for some time. As the visual acuity increased, the color sense was acquired, but the improvement in these two functions of the eye was not parallel. Vision made remarkable improvement and color perception also developed, but in an abnormal manner, and after it had reached a certain stage it seemed to remain stationary, neither increasing nor showing any tendency to correct its aberrations. Can this incorrect perception of colors be called true dyschromatopsia? Maggi denies this, as the perception of violet is dubious, and there is no perception of red, while one of the fundamental colors of red is perceived. There is perception of green and of yellow, but even this perception is erroneous, as a green skein is seen as pink, and a red skein as green. Hence, in this case the trouble is not a difficulty in distinguishing colors but abnormal perception of colors, and this in a single eye. Is this fact due to the opacity of the lens and the long inertia of that eye? Can it be due to a lack or inaptitude of the special fibers in the retina, which, according to the Young-Helmholtz theory, serve for the perception of colors, or is it due to a lack of the chemical changes which occur in the nerve cells destined for the perception of color according to the Hering theory? Or can it be the result of some change in the movements of the epithelium of the retina to which Angelucci ascribes the sensation of color? Maggi does not attempt to theorize on his case, but merely relates it in detail on account of the points which distinguish it from others of the kind, and because it demonstrates that it does not inevitably follow in all cases of congenital or infantile cataract that the form sense is always lacking and the color sense good. The case further shows that alterations in color sense may be encountered in a single eye alone.

ABSTRACT FROM AUSTRO-HUNGARIAN OPH-
THALMIC LITERATURE.

BY

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Ankyloblepharon Caused by an Attack of Acute Trachoma.

MICHAEL, KOS. (*Wiener Med. Wochenschrift*, August 22, 1903.) The author describes the case of a 10-year-old girl whose eyes had always been healthy and who, four months ago, contracted trachoma from the other children at school. The trachoma was quite acute and the conjunctiva very much inflamed. The secretion was considerable; after a time the conjunctiva of both lids became very much thickened and sclerosed. The child had been left without treatment for four months, and when she was presented for treatment the lids had already begun to grow together at their outer angles, so that the external canthus and about $\frac{2}{5}$ of the outer margin of the lids of both eyes had become adherent.

Inasmuch as the secretion and the acute conjunctivitis were as yet quite marked, these had to be first treated before anything could be done to enlarge the aperture of the eye. Then, after the acute conjunctivitis had subsided, the pseudomembrane between the two lids was divided by scissors, under cocain anesthesia, and in order to prevent the growing together of the cut surface, a suture was placed in the outer canthus and two more sutures in the margins of the lids. After three days the sutures were removed and two weeks later the patient left the hospital cured of her ankyloblepharon. There was no adhesion of the lids to the bulb (symblepharon). The most remarkable feature of this case was that a trachomatous inflammation of such short duration (four months) should result in so marked ulceration of the conjunctiva and in such extensive adhesions which resulted

in the growing together of the outer 2/5 of the lid margin in both eyes.

Orbital Phlegmon and Atrophy of the Optic Nerve.

OLLER. (*Wiener Med. Wochenschrift*, August 22, 1903.) The causes of orbital phlegmon are various. The resulting optic nerve atrophy is caused either by (1) a direct extension of the inflammatory process to the optic nerve, or (2) indirectly by purulent meningitis.

The author describes the changes in the optic nerve in the case of orbital phlegmon on which a post mortem examination was made. The nerve appeared thinner, softer and not round, but oval in circumference.

The nasal portion of the nerve was of a yellowish gray color, the temporal grayish white. The yellowish portion of the nerve tapered somewhat, being more voluminous toward the bulbus. The yellow discoloration was explained later on, when a section of the nerve was placed under the microscope.

In the portion of the nerve nearer the bulbus the neuroglia and the nerve fibres had disappeared almost entirely. It was an acute necrosis and acute softening of the optic nerve, this resulting in a discontinuation of the optic nerve fibres and therefore resulting in blindness.

The Result of Iridectomy in Primary Glaucoma.

VETTIGER, G. (*Wiener Med. Wochenschrift*, August 22, 1903.) These observations are based on statistics of 34 years, only such cases being taken into consideration which could be observed at least three years after the iridectomy. In cases of acute glaucoma iridectomy caused improvement; in 74 per cent. of cases the glaucoma was aggravated.

In case of chronic glaucoma improvement was noted in 39 per cent., the condition was unchanged in 14 per cent., whereas in 36 per cent. the glaucoma was aggravated by the iridectomy.

In glaucoma simplex, improvement in 0 per cent. Status idem in 25 per cent., conditions became worse in 67 per cent. Loss of the eye in 8 per cent.

The results of iridectomy in cases of glaucoma simplex are especially noteworthy, as they show a great gain in an affection whose tendency is to steadily progress toward total

blindness, the iridectomy having succeeded in 25 per cent. cases in checking the progress of the disease.

The fact of the loss of the eye in 7 per cent. of cases does not argue against this procedure because these eyes would become blind anyhow. The author then concludes by saying that (1) iridectomy has a favorable influence in most cases of glaucoma. (2) The sooner the iridectomy is performed the better as a rule in the result.

The Double Focus Ophthalmic Lens.

ADOLPH, Szily. (*Pester Mediz. Chirurgische Presse*, October 3, 1903.) The author of this article describes a peculiar form of cataract, which to many observers is as yet unknown. It is, of course, familiar to all of us that the beginning of a cataract formation is sometimes marked by steadily increasing myopia, but the cause of this phenomenon is as yet not very clear.

In the 16 cases described by the author the affection begins with a rapidly increasing myopia of the lens. The opacity of the lens begins very gradually and progresses very slowly. The changes which take place in the lens are characteristic.

The periphery or cortical part of the lens may be emmetropic or even hypermetropic, whereas the medullary portion of the lens shows a very high grade of myopia.

Lenticonus and lentiglobus can also be often shown anatomically in such lenses.

How Far is Primary Glaucoma Affected by Temperature and by the Seasons of the Year?

GEISLER, PETER. (*Wiener Med. Wochenschrift*, August 26, 1903.) Kurt Steindorff was the first to demonstrate that a certain well defined relation exists between the frequency of cases of primary acute glaucoma and the seasons of the year. He showed by records of Hirschberg's Clinic from 1875-1882 that these cases were seen far more frequently during the winter months than in warmer parts of the year and that during the hottest part of the year their frequency was often reduced to zero. He explains these records in the following manner:

The temperature of the atmosphere, by increasing or decreasing the blood pressure thereby indirectly affects the in-

traocular tension. It is a well known fact that cold increases the blood pressure and heat decreases it. Therefore, we can easily understand that intraocular tension should be increased during the winter months.

Some writers have claimed that low barometric pressure diminishes not only the blood pressure, but the intraocular tension as well. However the absolute and relative moisture of the air and the strength and direction of the air currents have no influence whatever upon the onset of the glaucomatous attack.

Many of us during the winter months are subject to a catarrhal inflammation of the nasal passages combined with more or less cough. This causes an increase of blood pressure and in persons afflicted with arteriosclerosis may be sufficient reason for an attack of glaucoma.

The winter with its short and dark days and its long nights, may indirectly, by dilatation of the pupil, favor the onset of an attack. Reading by poor light might also have some influence, inasmuch as it strains the muscles of accommodation, and thereby the zonule of Zinn becomes relaxed, the lens is moved forward and presses the root of the iris against the cornea, Fontana's space becomes closed and thus prevents the free passage of the aqueous humor.

The author tabulates 188 cases of acute glaucoma occurring in 175 patients taken from the clinical records of Prof. Wicherkiewicz. These records also showed the increased frequency decreased gradually as the warmer seasons approached, and during the hottest part of the year their frequency was reduced to nil. The author in conclusion thinks that these records are of undoubted practical value and that it is advisable to caution people with disposition to glaucomatous attack, or where one eye has already become blind by glaucoma to be especially cautious during the cold winter months, because the onset of the glaucoma is especially apt to break out at that time.

A Case of Cirroid Aneurism of the Right Ophthalmic Artery.

KREUTZ, ARTHUR. (*Wiener Medz. Wochenschrift*, September 12, 1903.) During the first half of the 19th century oculists were of the opinion that pulsating exophthalmos was the result of overdistension of the morbidly dilated orbital arteries

In some cases they believed that the artery had merely become very much dilated and over distended, in other cases they believed in the existence of true aneurism. But in no cases were they able to prove with absolute certainty the correctness of their diagnosis.

During the last half of the 19th century Nelaton was able to prove by autopsy in two cases of pulsating exophthalmos that the protrusion and pulsation of the eyeball is not caused by the overdistension of the weakened orbital arteries but by the intrusion of arterial blood into the orbital veins. In both of these autopsies the wall of that part of the internal carotid artery lying in the cavernous sinus was torn and the arterial blood, escaping through the hole in the arterial wall entered the sinus and thence the orbital veins.

Sattler compared critically all published cases of pulsating exophthalmos, and comes to the conclusion that all of them were caused in a manner similar to that described by Nelaton. And until the present time the only cause of a pulsating exophthalmos known to scientists was that of the aneurismal varix of that portion of the internal carotid lying in the cavernous sinuses.

The author describes his case in which he proves that the exophthalmos was caused not by the entrance of arterial blood into the orbital veins but by the overdistention of the dilated branches of the ophthalmic artery.

The patient, a 28 year old servant girl, presented herself to him in June, 1903, with a tumor of the right orbit which caused regular, intermittent, rhythmic pulsations of the protruding eyeball of the right side. Further investigation showed a circoid aneurismal swelling of the right external carotid artery, and still closer examination with the ophthalmoscope showed also aneurism of the only branch of the internal carotid artery which can be seen during life, viz: the central artery of the retina. The various branches of the right external carotid pulsated more strongly than the corresponding arteries of the left side and the rhythmical movements of the right sterno-cleido-mastoid showed that there was abnormally marked pulsation even in the common carotid of that side. Between the lower maxilla and the right mastoid process there was an elongated swelling which by palpation proved to be a mass of pulsating blood vessels. And during the arterial systole even the lobule of the right

ear was pushed forward only to recede again during the arterial diastole.

It is very evident that these pulsations in the ear lobule were produced by a similar cause as the pulsating exophthalmos. The mere fact that pulsating exophthalmos is on the same side of the head as the pulsating ear lobule makes it very probable that there is a common underlying cause for these pulsations. Ophthalmoscopic examination of the right eye further corroborated that view. The aneurism of some of the branches of the external carotid could be palpated, the cirroid aneurism of one branch of the internal carotid could be palpated, and the central artery of the retina could be very plainly seen.

The retinal bloodvessels presented a peculiar picture—small arteries which normally can hardly be seen through the ophthalmoscope were here to be plainly seen. They were thick and tortuous in shape. The part of the retina between the papilla and macula lutea was covered completely by a mass of intermixed dilated and tortuous bloodvessels. The main branches of the central artery were thicker and more tortuous than normal. There were no changes in the interior of the eye. The field of vision was normal.

The patient's history of the case also strengthened the conviction that this exophthalmos had been caused by a cirroid aneurism and not by the entrance of arterial blood into the orbital veins through rupture of that part of the internal carotid lying in the cavernous sinus.

The exophthalmos came on so slowly that the patient was not able to determine the onset of the affection. There was positively no trauma preceding this trouble.

All these facts tend to show that the pulsations in the exophthalmos were caused by the same agent as those of the ear lobule and also that there was not a true aneurism, but merely a cirroidal dilation of the arteries of the orbit.

Cinchonin Intoxication.

SCHOUTE. (*Wiener Mediz. Wochenschrift*, Sept. 12, 1903.) Malaria has been pandemic in northern Holland for the last two years and cinchona has often been prescribed to patients who have an idiosyncrasy against quinine. The author reports the case of a 40-year old woman who herself as well as her mother and sisters had a decided idiosyncrasy against

quinine which manifested itself in roaring in the ears, itching of the skin, etc. He prescribed three powders of 0.4, of cinchona sulf.

A few hours after the taking of the powders disturbances of vision, caused by a paresis of accommodation, appeared.

The patient had previously never complained of disturbances of vision after the use of quinine and whereas after the use of cinchona no symptoms of intoxication, e. g., buzzing in the ear, itching, etc., had appeared. Quinine intoxication, as a rule, causes changes in the retina and in the retinal bloodvessels whereas in cinchona intoxication as a rule the uvea is involved.

ABSTRACTS FROM POLISH OPHTHALMIC LITERATURE.

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ASSISTED BY

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A Few Words Concerning Surgical Dressings in Ophthalmology.

WICHERKIEWICZ, B. (*Postep okulistyczny*, Nos. 2 and 3, 1903.) The author first lays stress upon three cardinal duties which the eye bandage may perform: (1) oftentimes the bandage, or other occlusive dressing, has no other purpose than that of protecting the eye from the deleterious effects of dust, smoke, light, cold, moisture, etc.; (2) at another time the sole purpose is the immobilization of the eye and eyelids; here the binocular form of bandage is the most rational one; (3) lastly, there are the various dressings of a therapeutic nature, such as the wet dressing, moist heat, dressings saturated with antiseptic solutions, astringent and absorptive dressings (the 10 per cent. Tannin-Glycerine dressing, mentioned by the author, belongs to this latter category).

The requirements of the case determine the nature of the dressing, its form, and the material to be used.

The writer largely limits himself to the description of the

dressings used after cataract extraction. He briefly mentions the revolutionary changes the last few years have wrought in this field of practical ophthalmology.

It is known that Hjort and some American ophthalmologists have abandoned the use of air-occluding dressings composed of gauze, cotton and cotton-bandage or wire frame, after cataract extractions. They leave the operated eye without any dressing whatsoever, and depend solely on the natural protection afforded by the eyelids.

In 1899 a publication issued from the Eye Dispensary at Krakow, which, though not mentioning the open treatment of cataract wounds, yet laid stress upon the great advantages of the Wolfberg paper dressing. A properly cut piece of so-called satin paper is pasted, by means of ordinary gum-arabic, to the skin surrounding the eye. At that time a small piece of gauze and some cotton were placed on the closed lid of the eye to remind the patient that he is not to open it.

Since 1902 W. covers the eye with only the paper (hollow dressing), allowing the ball and lids an absolute freedom of movement. Results obtained since the introduction of this form of dressing have been most satisfactory, and have easily encouraged operators to adopt the same.

The advantages of a hollow dressing are : above all it in no manner interferes with the important and physiological eye-toilette, which depends upon a free circulation of the lacrimal secretions in order to bring about the most favorable conditions for the healing of the wound; it enables the conjunctival secretions to flow off freely, thus saving the eyeball from any possible irritation, as in the accumulation of a catarrhal or purulent secretion in the conjunctival sac is resident the greatest danger to the wound of operation, namely that of infection; a hollow paper dressing is lighter, cooler and also more comfortable to the patient than the thick gauze and cotton dressing retained in place by the bandage encircling the head; the paper dressing never becomes displaced by any movement of the head, occasions not the slightest pressure upon the eyeball, can be absolutely sterilized, is cheap and possesses undeniable advantages demonstrated by the most favorable post operative results.

The author incorporates extensive statistical tables upon 139 cataract extractions performed at the eye dispensary of

the Univ. of Krakow from October 10, 1902 to the end of February, 1903.

Of primary importance is the fact that in no case did infection occur. To these cases may be added eleven cataract extractions which the author performed in private practice during the same period, and with the same good results.

It is a positive fact that a successful, post-operative healing is dependent upon a variety of conditions, namely, proper preparation of the patient, strict aseptic precautions, a good operative technique, an intelligent and sensible conduct on the part of the patient during and after the operation. All these circumstances have been carefully and statistically considered by the author, and have been found to detract to no extent from the advantages of this form of dressing.

The compilation brings forward all the advantages of the hollow dressing in a convincing manner.

I cannot incorporate all the statistical details, but will mention that in 139 cataract extractions the anterior chamber redeveloped itself 110 times on the day of the operation, and the hyphema, formerly so common, was observed in only six cases.

For further details a perusal of the original article is advised.

Extraction of an Iron Fragment From the Anterior Chamber by the Aid of Haab's Electromagnet.

SENKENWICZ-IPOHORIKI. (*Postep Okulistyczny*, 1903, No. iv.) In addition to a brief description of the successful extraction of a needle-shaped fragment of iron from the anterior chamber by means of the large Haab electromagnet, the author mentions the fundamental indications and principles relative to the selection of instruments and operative methods for the extraction of iron fragments from the eyeball, which have become absolute laws in the school of Prof. Wicherkiewicz.

The eye dispensary in the University of Krakow is equipped with an elegant Haab electromagnet, but so far this has been used only in very exceptional cases, it being Prof. Wicherkiewicz's preference to use the Hirschberg hand magnet, with which he has successfully extracted iron particles from the interior of the eye in many instances.

We have no reason to fear the introduction of a sterilized

magnetic probe into the anterior chamber, provided the technique is thoroughly aseptic.

In the use of Haab's giant magnet there is a danger of rupture of the deeper tissues, a detachment of the retina, as a result of the powerful force with which the magnet attracts the fragment.

In exceptional cases, where the foreign body is lodged in the anterior chamber, Prof. Wicherkiewicz considers the Haab magnet very useful, as may easily be deduced from the description of the successful extraction given in this article.

Iridodialysis With Traumatic Inverse of the Iris.

GEISLER, PETER. (*Postep Okulistyczny*, 1903, No. iv.) The author has observed a very interesting case of iridodialysis in the University Eye Dispensary at Krakow. Following a trauma (blunt piece of wood) occurred an almost total detachment of the iris from the corona ciliaris, which was accompanied by a partial inversion, *i. e.*, the pigment layer of the iris was directed anteriorly, with the anterior surface of the iris resting upon the anterior surface of the lens.

The black band resting upon the opaque lens could be easily mistaken for the iris denuded of its more anterior layers, in other words, held to be the pigment layer from which the superficial layers had been abraded. This black band showed a crescentic portion easily to be held for the former pupillary border. As this portion of the iris was resting with its concavity directed upward, and indications pointed toward this particular portion of the iris as having been formerly located in the upper part of the periphery of the anterior chamber, the conclusion that the iris had sustained a complete inversion was justifiable.

The anatomic examination of the iris, which had been removed during the subsequent cataract extraction, demonstrated the correctness of the diagnosis. All the normal layers of the iris were present, but in inverse order.

The Pathology of Siderosis Bulbi.

BEDNARSKI, A. (*Postep Okulistyczny*, 1902, Nos. 8 and 9.) The author first fully reviews the present day opinions on siderosis bulbi, and cites numerous recent investigations by Leber, Hippel and others. To this he adds a short description of a case observed by Prof. Machek in the eye dispen-

sary in Lemberg. The eye, injured by an iron fragment, was enucleated. Author examined the eyeball anatomically, macro and microscopically, and finally microchemically. The microscopic preparations containing the iron fragments unfortunately remained in the alcohol for a half year after enucleation, therefore leading to the suspicion that the extensive siderosis present in this case was due, at least in great part to a gradual dissolving of the iron in the fixing solution. In this manner the siderosis is to be considered—*sit venia verbo*—a post mortem effect. To remove all doubt a series of experiments with guinea pigs was carried out.

Results, as follows, were obtained: (1) Eyeballs containing iron fragment and placed in a fixing solution show a gradual disintegration of the iron, with permeation of the various tissues of the eye (particularly when exposed to the influence of the atmosphere). Such a consecutive siderosis is characterized by a homogeneous, diffuse, yellowish-brown color, changing to a blue color, upon using Perl's reagent. The cell bodies never show brown-colored pigments. (2) Regions of the retina, atrophic through chemical action of the iron, showed large cells with a granular protoplasm containing brown bodies (degenerated cells of the retinal epithelium) and certain young cells whose origin remains unknown for the present.

The Bacillus Koch-Weeks of Acute Conjunctivitis and its Relation to Pfeiffer's Influenza Bacillus.

RYMOWICZ. (*Postęp okulistyczny*, 1902, Nos. 8 and 9.) The author publishes the results of his biological and morphological studies of these two bacteria. Extreme difficulties were encountered in cultivating the Koch-Weeks bacillus. After many experiments a suitable culture medium, on which the Koch-Weeks bacillus grew for several generations, was found. It consists of agar boiled with one and one-half per cent. of human placenta, or the hemoglobin of pigeon blood. This culture medium also may be used with success for the influenza bacillus. There is such a marked microscopical similarity between these two organism that it is impossible to differentiate them; neither is there any difference in the appearance and dimensions of the colonies, or the rapidity of their growth. The microscopic characteristics are identical; both have the same dimensions, 0.5 to 1 mikrons long and about

.25 mikrons thick, with both extremities slightly rounded. Both are found in great numbers in the secretions; both form colony-like groups; sometimes they form chains composed of numbers of bacilli lying in two's like diplobacilli. Tincturally they offer no differential characteristics; both decolorize completely and rapidly with Gram's stain; both stain beautifully with very weak carbol-Fuchsin solutions. Microscopic examination of colonies demonstrates that both have the same appearance and growth, and under certain conditions are subject to the same transition and evolution forms. On examining older generations both showed thread-like, variously curved forms of a considerable length (25 to 30 mikrons). Their thickness is almost identical with the normal forms of the bacilli. Another evolution form of both organisms was found in all 6 or 7 day old colonies, i. e., they presented small globular bodies which stain poorly, and which varied in diameter from $1/4$ to $1/5$ mikrons. Finally, after a more protracted cultivation, about two months, and only upon the transplantation of older colonies, a degeneration form was found, identical with the type described by Pfeiffer as pseudoinfluenza. They are larger and thicker bacilli, showing an arrangement in loops. In length they vary from 3 to 8 mikrons and present a thickness of $1/2$ mikron. Their relations, in symbiosis to other microbes, manifest no important differences. Both grow more rapidly and more luxuriantly in the presence of pseudodiphtheria bacilli. In regard to the Koch-Weeks bacillus the author has amply satisfied himself, as has also Weeks, that the organism will not refuse to grow on ordinary half per cent. agar, without any addition of hemoglobin, particularly when inoculated with pseudodiphtheria bacilli. To fix the absolute identity of these two organisms it would be necessary to demonstrate the development of a typical acute conjunctivitis by inoculation with a culture of influenza bacilli. All the experiments made in this direction have resulted negatively, as both organisms have been found to be non-pathogenic to the conjunctiva of those animals used for experimental purposes. When used subcutaneously, intravenously or intraperitoneally, both organisms have caused the same general symptoms and death of the animal with identical post mortem changes. Under similar conditions both organisms possess the same degree of virulence. Failing to establish any differences in the two organ-

isms the author concludes that they *are* identical. The Koch-Weeks bacillus occasions influenza on gaining entrance into the air passages of the lung, and gives rise to an acute conjunctivitis if the eye becomes infected. The truth of this conclusion seems to be demonstrated by countless epidemiological observations.

Luxation of the Bulb Following a Blow from a Cow's Horn.

DZUATOWSKI, (*Postep okulistyczny*, 1902, No. 9.) The author first describes the mechanism by which a dislocation of the bulb is occasioned, and cites the experiments of Axenfeld performed on human cadavera for the purpose of determining whether or not it is possible to dislodge the bulb from the orbital cavity solely with the aid of the fingers.

Records show that in cases of acute insanity the individuals have succeeded in dislodging the eyeball from the orbital cavity with the fingers.

Luxations of the bulb have been reported by Axenfeld, Rothenspieler, Bock, Schauer and Berlin. To Berlin belongs the credit of displacing the earlier, more improper nomenclature with the now more generally used term "luxatio bulbi."

The author describes an interesting case observed in 1901, in the eye dispensary of the Univ. of Krakow, while on the service of Prof. Wicherkiewicz. A farmer, aged 68, sustained an injury of the right eye through a blow from a cow's horn. Examination showed a marked protrusion of the bulb with inability to close the lids. The sclera, above the cornea, was completely exposed. The superior and external recti and the superior oblique muscles were ruptured. The fundus of the eye could not be examined owing to the traumatic opacity of the cornea. The following operations were performed by Prof. Wicherkiewicz: reposition of the bulb into the orbital cavity, suture of the superior oblique and temporary blepharorrhaphy. A corneal ulcer and hypopyon developed subsequently. The ulcer healed rapidly and the hypopyon was emptied. The patient was discharged with preservation and normal position of the eyeball, though marked limitation of the movements of the eye and anesthesia of the cornea and bulbar conjunctiva remained.

Two Cases of Traumatic Enophthalmus.

LUNIEWSKI, S. (*Postep okulistyczny*, 1903, No. 2.) The

two cases of enophthalmus were observed by the author in the general hospital at Kolomea. In one case the injury was inflicted by a thrust with the point of an umbrella, in the other by a horse-shoe.

Traumatic enophthalmus may be uncomplicated or associated with fracture of the osseous boundaries of the orbital cavities. Relative to the development of enophthalmus, the author considers two possibilities: (1) the trauma may cause the enophthalmus in a mechanical manner, and that, either by occasioning an increase in the intraorbital space through fracture, or a decrease in the same by retraction and contraction of scar tissue; (2) the trauma may give rise to enophthalmus reflexly in an indirect manner. In such cases one must suppose it to be caused by minute hemorrhages into the nerve sheaths (particularly the sympathetic nerve) and slight compression of the nerve fibres. Mahlakoff believes in the possibility of a rupture of the ophthalmic artery; this seems improbable to the author, or at the most, may only be applicable to exceptional cases. Section of the cervical branch of the sympathetic nerve is known to lead to enophthalmus and slight ptosis. This last named symptom was observed in both cases and indicated, an injury to the sympathetic nerve.

In the first case, where enophthalmus developed immediately after the trauma, and recession of the bulb into the orbital cavity occurred some weeks later, the author believes a retrobulbar hemorrhage, with subsequent contraction of the scar tissues, to have been the cause.

In the second case, owing to the presence of mydriasis and slight paralysis of accommodation, associated with the enophthalmus, the most probable conclusion seems the presumption of a compression, tearing or rupture of the sympathetic and other nerves, particularly the oculomotor.

Rupture of the Retina and Proliferative Retinitis.

NOISZEWSKI, K. (*Postep okulistyczny*, 1903, No. 3.) Since Jaeger published the first case of proliferative retinitis, the question of the etiology of this condition has often been agitated. Leber and his pupils, on the evidence of anatomical investigations, claim the condition to be due to recurrent hemorrhages. Manz and others consider it a proliferation of the connective tissue elements of the retina.

The author observed a case of proliferative retinitis in a woman aged 42, in which primarily, there had been a hemorrhage of the vitreous. Later the ophthalmoscopic picture demonstrated the membrane in the vitreous to be composed of detached and ruptured retina.

The ophthalmoscope showed the same condition in the case of a young man who had sustained a contusion of the left eye in a railway accident. Here the author gained the impression that the pure white, spindle-shaped membrane situated before the optic papilla was formed by the nerve fibre layer of the retina, detached and ruptured by hemorrhage.

Proliferative retinitis is to be considered as a detachment of the retina, in which its individual layers are separated and at the same time ruptured,

ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.

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An Improved Operation for the Relief of Ptosis.

HARMAN, N. BISHOP, Cambridge, Eng. (*The British Medical Journal*, Sept. 26, 1903.) The operation here described is a modification of the method adopted by Mules, in which he inserts a wire into the lids and makes this fast to the frontalis muscle, and leaves it permanently *in situ*. This has the disadvantage that if bent too acutely it may break, and it is necessary to split the free edge of the lid so that a groove may be formed for the loop, and this may injure the hair follicles. The buried knots above the brow may cause irritation, and the lid cannot be everted except with the risk of breaking the suture, and finally, a wire never becomes a part and parcel of the body and is always liable to expulsion.

These difficulties may be overcome by substituting a fine chain for a wire. The chain used is known as "wove chain." It is fine and delicate, and will sustain a weight of 15 lbs.

before breaking. The chain is inserted by the aid of a 4-in. abdominal needle with a triangular cutting edge. The needle is inserted above the external angular process, and passed up and in deeply beneath the tissues of the forehead, and is withdrawn rather to the inner side of the middle of the lid. The needle is inserted again at the same point and passed straight downward through the lid to within a short distance of the lid margin, again inserted here, passed horizontally along the lid margin, and again brought out. Reinserted at the same point and passed upward parallel to the other vertical limb, and brought out above the eyebrow, and finally inserted at the same spot, and withdrawn close above the internal angular process. The chain is thus completely buried and evenly stretched. Lastly, by traction on the free ends the lid can be raised to the desired degree and the free ends cut off and buried.

An Operation for Ptosis.

ENSOR, H. COLLEN, Cardiff, Eng. (*Ophth. Review*, Nov. 1903, and *Brit. Med. Journal*, Sept. 26, 1903.) With a view of obtaining a more symmetrical appearance of the face and a more lasting effect than is frequently the case with other operations, the writer devised the following new operation in a girl of 9, who presented a complete unilateral congenital ptosis:

The eyebrow was shaved and slightly raised, and an incision was made down to the periosteum covering the supra-orbital ridge from the internal to the external angular process. A second incision was made through the skin only from the extremities of the former incision and below it, so that a portion of the skin, about 5 mm. broad at the inner side, and 7 mm. at the outer side, could be removed with scissors, as here the skin was more abundant, and the occipito-frontalis did not act so powerfully. Pacquelin's cautery was then applied to burn the tissues at the upper part of the wound, thus charring the tissues to the bone along its whole extent, the orbicularis palpebrarum was also burnt so as to weaken the muscle. The wound was then dressed and allowed to granulate, and it healed in three weeks.

In order to produce a little more effect the operation was practically repeated later on, and the result was excellent. This operation secured the following results:

1. The appearance is far more symmetrical than when one eyebrow was much higher than the other.
2. The hiding of the scar by placing it immediately below the hair of the eyebrow.
3. The formation of a fixed groove under the eyebrow instead of the appearance of vertical bands produced by the constant action of the occipito-frontalis muscle.

Skin Grafting for the Restoration of the Eye-Lids.

DODD, O., Chicago (*Jour. Amer. Med. Asso.*, October 17, 1903), after considering the merits and disadvantages of pedicle, Wolfe and Thiersch grafts, reports four cases and concludes:

"For the upper lid Thiersch grafts should, always be used, unless the whole thickness of the lid is destroyed.

In forming the lower lid, if there is adjacent skin available it should be used to form the lid and the resulting defect filled in with Thiersch grafts. When there is dense cicatricial tissue for the floor of the graft a pedicle graft is the only one which I have found satisfactory.

Should pedicle grafts not be available and the underlying tissue have proper vascularity, then either Wolfe or Thiersch grafts may be used, and my results have been best with a Wolfe graft prepared very thin."

A New Advancement Operation.

SAVAGE, G. C., Nashville. (*Ophthalmic Record*, November, 1903.) Since there are many cases in which the full effect desired cannot be accomplished by the muscle tucking or shortening, although an ideal operation, an advancement must occasionally be done.

The writer's operation is done without cutting the tendon, and requires only a local anesthetic; the following are the steps:

- (1) Make a cut through the conjunctiva parallel with the plane of the equator, a short distance behind the insertion of the tendon. This cut should not include the capsule of Tenon.

- (2) An opening should be made through the capsule of Tenon just below the border of the tendon, through which should be passed, beneath the tendon, a large strabismus hook. When the point of this hook reaches the structures

above the tendon a snip should be made in the capsule so as to allow it to emerge. In this way the hook is given a better hold beneath the tendon.

(3) The tendon is now lifted by the hook so as to make the taking of the stitch through the muscle and capsule easy, without risk of dipping the needle into scleral structure. The stitch is taken as in plain sewing and the puncture and counter-puncture should be one-eighth to three-sixteenths of an inch apart. In taking this stitch the conjunctiva is held back by means of forceps in the hands of an assistant. The loop, consisting of the middle of the suture which is armed with two needles, is beneath the central part of the muscle, at just that distance behind the tendonous insertion indicated by the judgment of the operator.

(4) The forceps and hook having been removed, the operator, taking the fixation forceps in his own hand, seizes the tendon at its insertion that he may hold the eye steady while passing the two needles into the scleral tissue, the anterior conjunctival flap being held forward by the assistant. Either the upper or lower needle may be passed first, and the points of passing these are chosen with the view of not changing the plane of action of the muscle, there being no cyclophoria, or of changing this plane when there is cyclophoria. In the former case the one needle is passed just as far below the plane of the horizontal meridian as the other is to be passed above this plane. The lower needle should be held parallel with the plane of the equator and well behind the canal of Schlemm. The puncture made below, and the counter-puncture made above, should include only a narrow band of scleral fibers, and the dip of the needle into the sclera should not be too deep. A similar vertical stitch above the horizontal plane should be taken with the other needle. The space between the two vertical stitches should be as broad as the stitch previously taken in the muscle, and the one scleral stitch should be as far below the horizontal plane as the other is above this plane. After the scleral stitches have been taken the two needles should be passed through the anterior conjunctival flap.

(5) The last step of the operation is the tying of the suture. This I always do over the silver suture plate devised by Dr. G. H. Price, of Nashville. The two needles having been passed through the two holes in the suture plate

are now removed and the surgeon's knot is tied, but not until that part of the muscle through which the loop was passed has been drawn as far forward as necessary, usually up to the scleral stitches. Since this part of the muscle can not be drawn a greater distance in advance of the insertion of the tendon, than the distance between the loop of the suture and the insertion of the tendon, it becomes evident that the muscle stitch should be the same distance behind the insertion of the tendon as the scleral stitches are in front of it. The folded muscle and tendon lie flat and the posterior conjunctival flap is drawn forward nicely.

Tumors of the Conjunctiva.

SHUMWAY, EDWARD A., Philadelphia. (*Jour. Amer. Med. Assn.*, Sept. 26, 1903.) The paper is limited to those tumors which originate primarily in the conjunctiva and are divided into two great classes, (a) malignant, (b) benign.

"The malignant growths are represented by carcinoma and sarcoma. They appear clinically in very much the same forms and in patients usually beyond the fortieth year of life. Their point of predilection is at the corneo-scleral limbus, and it is often impossible to distinguish them, except by microscopic examination. The growth of carcinoma at the limbus has been said to correspond with its occurrence elsewhere in the body at the junction of epithelial surfaces of dissimilar structure."

"The carcinomatous growths appear first as small, pale reddish masses, which have but little tendency to spread inward, both cornea and sclera acting as very resistant checks; so they grow superficially, although rare cases have been described in which there was an inclination to extend inward from the start. In contrast to some of the benign epithelial growths, especially papilomas, they have no tendency to the formation of a pedicle, but possess a broad base, and are closely united to the underlying tissues.

The tumors consist of proliferating masses of epithelial cells, which develop directly from the surface epithelium and are separated into alveoli by a connective tissue stroma which is an extension of the connective tissue of the sclera and cornea. The behavior of the surface epithelium is at once a characteristic difference between carcinoma and sarcoma. In the former it is directly involved, while in the latter it passes

smoothly over the surface of the growth which raises it from the structures beneath as it extends. As a rule carcinoma grows very slowly, but in some cases it forms large, fungous masses on the surface of the eyeball, the microscopic structure of which resembles papilloma very closely, and the examination of superficial portions of the tumor may lead to a very erroneous diagnosis. If allowed to remain, all of the carcinomas will ultimately perforate the eyeball, usually along the vessels and nerves at their point of penetration through the sclera. In some cases there is a distinct pigmentation of the stroma, so that a number of cases of melanocarcinoma of the corneoscleral limbus have been reported. Panas, in fact, considered melanosarcoma to be the exception and melanocarcinoma to be the rule.

The question of malignancy is difficult to determine. The rapidity of growth may vary greatly; likewise the involvement of the cornea and sclera. Even superficial growths tend to recur, and while the extension by metastasis is rare, they should be thoroughly removed, and the eyeball sacrificed, if it is evidently involved."

"Sarcoma, like carcinoma, occurs in individuals usually beyond middle life, and most frequently at the corneoscleral limbus. As a rule, the growths are pigmented, the pigment occurring both in the tumor cells, and in the connective tissue stroma, in which the cells are imbedded. As in the case of melanosarcomas of the skin, the conjunctival sarcomas develop chiefly from the pigmented nevi—the so-called pigment spots—on the conjunctiva, and, as Wintersteiner has shown, usually in the area corresponding to the palpebral opening, probably as the result of repeated slight traumas. The study of these pigmented nevi, or melanomas, is of importance, therefore, for the correct interpretation of some of the facts concerning sarcomas. Their structure corresponds closely to that of the skin nevi: circumscribed collections of large polygonal cells which are imbedded in a groundwork of subconjunctival tissue."

"From these pigment spots the sarcomas develop slowly into soft, vascular growths, which are usually more prominent than the carcinomas, and occasionally possess a pedicle. When they project over the surface of the cornea they are not ordinarily attached to it, but may be lifted away by means of a probe. Laterally, they are more firmly attached

to the bulbar conjunctiva, but can usually be moved freely over the surface of the sclera. If they are not removed they continue to grow, and may reach a large size. In the majority of cases the cornea and sclera offer a remarkable resistance to invasion, and very few cases have been reported in which the tumor had invaded the interior of the eye. At times several nodules may appear at the limbus, or secondary nodules may spring up on the lids (Wadsworth and Verhoeff). Recurrence after removal is very frequent, and may take place in the same position, or at a different portion of the limbus. They are commonly said to be less malignant than sarcomas occurring elsewhere."

"There is a history of recurrence in 81.8 per cent. of the cases in which the patients were subsequently observed, local metastasis in 23 per cent., and general metastasis in 11 per cent. They therefore consider that epibulbar sarcomas are highly malignant, and believe the eyeball should be at once removed, if the patient's consent can be obtained.

Microscopically, the tumor consists of closely packed, spindle-shaped cells, running in definite bundles, or more frequently, the cells are arranged in distinct alveoli, separated by a connective tissue stroma, and constitute the so-called alveolar sarcoma. In the latter case the cells may be spindle-shaped, but in many they show large, flat forms, which are epithelioid or endothelial in type. The growths are, however, to be distinguished from carcinomas by the absence of any involvement of the surface epithelium. These growths are well represented in the collection of this year. Some possess spindle-shaped cells; others show the epithelioid type.

Primary sarcoma of the conjunctiva of the lids is very rare although the lid conjunctiva may be involved by implantation or recurrence of an epibulbar growth. Cases of lymphosarcoma of the plica semilunaris and of the fornix have been described as rarities. Lymphoma of the conjunctiva has been found in malignant lymphoma, with general involvement of the lymph glands of the body, and apparently as the first symptom in some instances. Very marked hypertrophy of the adenoid tissue of the conjunctiva, in the transition folds, with the formation of large tumor masses, which may cover the eye and make the opening of the lids difficult, occurs in the condition known as amyloid degener-

ation of the conjunctiva. Microscopic examination shows, in the beginning stages, great increase of the adenoid cells and the subsequent formation of amorphous masses, which in some instances give the reaction for amyloid, in others for hyaline."

"Carcinoma and sarcoma occur occasionally as primary growths on the caruncle, and show here much the same characteristics as on the skin surface. Carcinoma has much greater tendency to form 'pearly bodies' in this position than on the conjunctiva."

"The benign growths of the conjunctiva are either congenital or acquired. The congenital forms are sessile, while the acquired forms are usually polypoid in shape, and possess a pedicle. By far the most frequent of the congenital growths are the dermoid tumors, these form flat, dull white growths of firm consistency, usually situated at the corneo-scleral junction, on the temporal side, and quite firmly attached to the cornea and sclera. The surface is often dry and may be covered with fine hairs, or, more rarely, with a few long hairs which irritate the eye by their presence. Microscopically, they represent small islands of skin. The epithelium is thickened, cutaneous in character, and covers a mass composed of dense connective tissue, in which hair bulbs, sebaceous glands and sweat glands may be imbedded. Frequently associated with other congenital anomalies, such as coloboma of the lid, they may take on a sudden, rapid growth in later life, and should be carefully removed. Most of the later writers assume a temporary attachment of the amnion to the eyeball during fetal life as the explanation of their origin."

"More rarely, subconjunctival lipomas occur beneath the bulbar conjunctiva. They appear as yellowish masses situated generally in the outer angle of the eye, between the insertions of the external and superior rectus. Microscopically, they consist of lobules of fat, sometimes associated with considerable fibrous tissue. They frequently contain gland tissue, and as they are congenital, may be more properly termed dermolipomas. Some authors have contended that teratoid elements are always present, although they are easily overlooked."

"Occasionally they grow to a considerable size at puberty. They can be removed without difficulty, and show no tendency to recur."

"As rare congenital tumors, about twelve cases of subconjunctival osteoma have been reported. These have been situated usually in the supero-external portion of the eyeball, which is also the position in which the lipomas are most frequently found. They represent small pieces of true osseous tissue, with lacunae, bone corpuscles, etc., and are best explained as the result of a temporary adhesion of the amnion to the eyeball, and the subsequent development of bone in the tissue thus formed."

Lymphangiomas and telangiectasias have also been described as very rare congenital growths.

"The acquired forms of benign growths are, in the majority of cases, polypoid in form. In the older text books all tumors of the conjunctiva which had a distinct pedicle were called polyps. Under this term, however, many different forms were included, and we now know that both soft and hard fibroma, adenoma, papiloma, granuloma, angiosarcoma, and even tubercular conditions, may assume a polypoid appearance, as a result, probably, of the constant movements of the eyelids. As Elschnig states, true polyps, in the strict anatomic sense of the term, i. e., hyperplastic growths of circumscribed portions of the conjunctiva, which include all of its elements such as are found in the nose, esophagus, intestines, etc., have never been described on the conjunctiva." "Fuchs and Panas made a separate class of polyps, and the name may be retained and used to designate the fibromas of the conjunctiva.

Fibromas are represented by two forms, soft and hard. The soft fibromas occur chiefly in the fornix, or in the palpebral conjunctiva, grow quite rapidly and possess long pedicles. They are composed of parallel bundles of spindle cells in a finely fibrillar tissue, and often contain many bloodvessels. The presence of these vessels is the cause of a characteristic symptom that is often observed in connection with the soft fibromas, viz., severe bleeding on the slightest traumatism. Removal and cauterization of the base with nitrate of silver, or with the actual cautery, usually prevent any recurrence. Less frequent are the hard fibromas, which arise chiefly from the palpebral conjunctiva and from the caruncle. Their surface is smooth and covered with a thin layer of epithelium. The histologic structure is that of fibrous connective tissue, with comparatively few cells and bloodvessels. They cause

no inconvenience unless large, and when removed have no tendency to recur.

Quite closely related to the soft fibromas are the granulomas which develop in places where a superficial loss of conjunctival tissue has existed, most frequently after tenotomies and enucleations, and also after rupture of chalazia on the internal surface of the lid. They are composed of naked masses of pure granulation tissue; closely packed polynuclear cells in a fine reticulum, which contain numerous capillary blood-vessels. There is no epithelial covering, and the little growths may be snipped off, or, if left alone, will finally be constricted off by the contraction of the conjunctival tissue surrounding their base.

The fibromas must also be distinguished from the small growths on the tarsal conjunctiva and about the limbus in spring catarrh. These present themselves in the form of broad, flattened papillae, which have been likened to paving stones, and while they cannot strictly be included among tumors of the conjunctiva, as they occur in the course of an inflammatory process and disappear without leaving any trace, they nevertheless resemble the fibromas very closely in their histologic structure. They consist of dense fibrous connective tissue, the fibers of which may show a peculiar glassy degeneration, and are covered with a thickened layer of epithelium, which, especially in the circumcorneal growths shows a marked tendency to send invaginating processes of cells into the depth of the tissue, so that the appearance is very similar to that found in cancrroid.

"Another form of polypoid tumor of still greater importance is papilloma, or papillary fibroma.

"They are among the most common tumors of the conjunctiva. They form small growths, which may be distinguished clinically from the fibromas by the fact that their surface is not smooth, but is covered with tiny papillae, like the surface of a raspberry. Frequently multiple, they occur chiefly in the neighborhood of the caruncle and semilunar fold, but also on the tarsal and bulbar conjunctiva, and unless removed very thoroughly show a decided tendency to recur. They are composed of branching papillae of connective tissue, surrounded by thick mantles of epithelial cells, the preponderance of the epithelial cells showing that it is essentially an epithelial proliferation with which we

have to deal. The connective tissue may be so little developed that the epithelial cells are found almost in contact with the walls of the capillary vessels. At times they are low and wartlike, at others they show long, villous processes and have a structure resembling a cluster of feathers."

"When the papilloma originates on the caruncle, the surface epithelium partakes more of the character of skin epithelium, while on the conjunctiva it frequently contains numerous goblet cells. The question as to their malignancy is often difficult to determine. When situated on the conjunctiva near the limbus they may be mistaken for an early stage of carcinoma, but on the other hand, while usually benign, they do unquestionably show at times a tendency to undergo carcinomatous degeneration and involve the tissues of the eyeball and lid."

"Adenomas occur occasionally on the eyeball, in the neighborhood of the caruncle, as pale red, isolated tumors, which may possess a pedicle or have a broad attachment. Only five cases have been reported."

"On the conjunctival surface of the lids, adenomas have been found originating in Krause's glands, at the border of the tarsal cartilage in the Meibomian glands, and in the modified sweat glands of Moll. At times they show by their rapid growth and involvement of the surrounding structures that they are essentially malignant, or adeno-carcinomas. The greater number of such cases originate in the Meibomian glands, and show alveoli of large epithelial cells, which degenerate quickly and form large, poorly-staining masses in the center of the alveoli. Of course, these growths are not really conjunctival tumors, but since they may appear as tumors on the conjunctival surface of the lid, they must be mentioned for the purpose of differential diagnosis."

Hemangiomas consist of newly-formed capillary vessels, and should be sharply distinguished from varices and aneurisms. If they contain much fibrous tissue they may be termed angiofibromas, and are then closely related to the vascular fibromas. They may be congenital or develop in later life, and occur as primary growths on the palpebral conjunctiva, in the fornix, on the bulbar conjunctiva, and plica semilunaris, as round, polypoid and occasionally sausage-shaped growths, the surface of which is sometimes smooth and sometimes nodular. They may remain station-

ary; at times they grow slowly, at others rapidly, without any apparent cause. When combined with sarcoma, the angiomatous formation is of secondary importance, and their course depends on the sarcomatous character of the tumor. Their histologic structure consists of twisted capillary vessels, which may also be dilated. If large blood cavities are present, we have cavernous angiomas, which are more rare. In their treatment the best results have been obtained by excision.

Finally, as comparatively rare forms of growths, we have the cysts of the conjunctiva. These develop in three chief places: on the bulbar conjunctiva, in the fornix and on the palpebral conjunctiva, in the form of transparent vesicles filled with a clear serous fluid. Those of the bulbar conjunctiva represent usually small dilatations of the lymph vessels, and are hence lymphangiectasias or lymphangiomas. They occur in the neighborhood of the cornea, and are generally multiple, like strings of small, transparent pearls. Sometimes they communicate with each other, and more rarely they form isolated, yellowish cysts, which, however, remain comparatively small, and are thus to be differentiated from the cysts which originate in the conjunctival glands.

Preliminary Note on the Pathology and Diagnosis of Spring Catarrh.

HERBET, H., India. (*Brit. Med. Journ.* September 26, 1903). This report deals only with spring catarrh observed in natives of India, and possibly the tissue changes may be more advanced than in those living in temperate climates.

The most noticeable change is the remarkable infiltration of the affected tissues both ocular and palpebral with eosinophile leucocytes. By fixing with mercury these cells are at once seen to be eosinophiles, and the greater the infiltration of cells the greater is the proportion of these special corpuscles. This infiltration is very rare, and the only other place in which he was aware of its occurrence was in some cases of pemphigus of the skin. The infiltration is only very marked in the more irritable stage of the affection. There is ordinarily very little exudation in spring catarrh, but it is quickly induced by slight irritation of the surface

Thus if the lid is everted for examination it will be found that after a few minutes there is some exudation, and this if examined fresh under the microscope will be found to be full of eosinophiles. This is a most important point in the diagnosis.

Sections of the limbus show breaches in the epithelium as well as minute vesicles situated in the epithelial layer and these containing eosinophiles and other wandering cells. The contents of these vesicles, as well as the bare spots, stain to some extent with fluorescein and are then readily visible clinically.

In six cases in which Major Herbert had examined the blood there was an increase of from 10 to 20 per cent. of the total leucocyte count. This is not uncommonly in natives due to nematode worms in the intestine. Ordinary inflammatory exudation contains very few eosinophiles, and one may fail to see them at all in a smear preparation, but they may be seen in large numbers in the pus thrown out around the guinea worm.

Finally, in some sections stained with polychrome methylene blue there are intracellular bodies which may possibly be parasites.

A Case of Vernal Conjunctivitis.

ALLPORT, FRANK, Chicago. (*Ophthalmic Record*, October, 1903.) "So far as the writer's knowledge extends no well authenticated case of a cure of this stubborn disease exists, and it may furthermore be asserted that no remedy has yet even been proposed that has shown itself as really capable of affording permanent and satisfactory relief during an entire season of hot weather, and he ventures the assertion that no one who has ever actually observed and recognized this peculiar, distressing and intractable disease, and who has—season after season—endeavored to afford relief, not to say cure, will ever again confound it with phlyctenular conjunctivitis, or any other ocular disease, and will not easily or carelessly dispose of the therapeutic side of the subject, and knowing that he has at 'east afforded absolute relief from any suffering whatever for an entire summer, the satisfactory result has led him to report this one case, in order that his colleagues, who may here and there be struggling with this provoking malady, may turn to the x-ray and find relief."

A young lady of 19, living in refined and wealthy surroundings, for seven years suffered with characteristic palpebral vernal conjunctivitis, for which she consulted numerous specialists, both in this country and Europe. She was always treated for chronic trachoma, and never with the slightest success. The growths were frequently rolled with Knapp's forceps, and amputated entirely, but always recurred worse than before. Her trouble invariably began on the appearance of hot weather and disappeared at the first frost. A sojourn to cold climates during the summer brought measurable relief. A season's treatment by the writer with the usual methods resulted in absolute failure.

Knowing the results by Dr. W. A. Pusey and others in the removal of epithelial and other masses by the x-ray, the writer determined to test the effect of this agency upon the lids of Miss N., and she arrived in Chicago, June 11, for this purpose. At the suggestion of Dr. Pusey the growths were first amputated, as by this means the work of the x-ray would be much facilitated.

A special instrument for holding the lids everted and protecting the eyeball at the same time was devised, which is almost the same thing as a chalazion forceps, with the shield larger.

The exposures were two to three minutes at first, and finally prolonged to ten minutes, for each eye, the face being covered with a lead mask with an elliptical opening, exposing only the everted lid.

"The patient was treated in all about eighty times, and while but little, if any, improvement could be at first observed in the diminution in size of the growths, after a while they began to disappear, and by September were practically gone, leaving in their stead smooth and apparently harmless cicatricial tissue. During the entire course of the ray treatment the patient has been perfectly free from photophobia, redness, itching, irritability, etc., the drooping lids have disappeared, the use of the eye has been resumed, and, in other words, she has passed a summer of perfect comfort, notwithstanding the fact that her treatment has been carried on during the hottest months of the year. The writer is aware of the fact that positive assertions are not actually warranted until next summer; nevertheless he believes that the case is cured, and sees no reason for believing

that the growths will reappear upon soil which is now ordinarily a healthy cicatricial tissue. Dr. Pusey feels that in order to be on the safe side, the patient should have three or four weeks' treatment next spring."

Septic Conjunctivitis.

DOYNE, R. W., Oxford, Eng. (*The Lancet*, Nov. 7, 1903.)
 "From time to time among private patients of the better class one sees cases of acute inflammation of the conjunctiva with great thickening of that tissue and marked enlargement of the papillae of both upper and lower lids, resembling somewhat in this respect, only more so, a very acute follicular condition provoked by atropine; the inflammation is usually limited to the palpebral conjunctiva, but there is a tendency for it to pass round the fornices and to involve the ocular conjunctiva. There is free lacrimation and the discharge is more serous than purulent. Ptosis, more or less marked, is present. There is generally tenderness or enlargement of the preauricular glands and a good deal of constitutional disturbance is present. The condition is generally limited to one eye. Ophthalmic surgeons of experience will, I think, at once recognized the affection I am attempting to describe, but those textbooks that notice it, are, as a rule, rather vague and some, I believe, classify the condition under acute trachoma, with which disease, however, it has hardly anything in common. It yields slowly but with certainty to nitrate of silver, sulphate of copper or better still, to argyrol (30 per cent.) in the course of from three to eight week. It is only when treated by hot fomentations, cocaine or tying the eye up (too often the case) that the affection becomes exaggerated and extends to the cornea, producing a "soppy" condition of that structure and sometimes small infiltrated ulcers toward its margin.

I have for many years seen isolated cases of this form of conjunctivitis occurring as far as my memory serves me in the spring, summer and autumn, rather than in mid-winter. My reason for drawing attention to it now is the fact that this summer, at any rate in the Oxford district, there has been quite an epidemic of such cases. In two days recently I have seen three severe instances quite unconnected with each other. It would be interesting to know if this has been the experience of surgeons in other parts.

The bacteriology of this affection should be interesting; it cannot be very contagious, for with all ordinary precautions it is limited to one eye. The train of symptoms suggest a septic origin and I have some times imagined I could trace a connection with mangy dogs or cats but this is little more than speculation. Perhaps others will be able to define a cause with more authority.

The X-Ray Treatment of Trachoma.

MAYOU, STEPHEN. (*Ophthalmoscope*, November, 1903.) Whilst watching the clinical and histological changes which take place in rodent ulcer and lupus of the eyelid under x-ray treatment and finding no serious injurious effect on the globe, it occurred to me to apply this form of tissue stimulation to other diseases of the eye, more especially to trachoma and corneal opacities. With that idea, one eye of a severe bilateral trachoma was exposed in a manner somewhat similar to that described below; after 24 sittings the disease cleared up, and encouraged by this case some 15 others were treated with good results; since that date the treatment has been adopted by many observers with, on the whole, satisfactory results.

The method adopted is as follows:—the patient is seated in front of a focus tube, the head being supported by some convenient form of rest; the upper lids are then everted and either held so by the fingers or by a Reid's clamp. If the fingers are used, they must be protected by bismuth ointment and cotton gloves, a clean pair being kept for use with each patient. If there is no pannus the cornea is covered by pushing up the lower lid, but in bad cases of pannus the cornea is exposed. The distance of the eye from the anode should not be more than 9 inches; a self-regulating tube having a spark-gap of four inches and a current of 6 amp. is most suitable. Four minutes' exposure is given for six successive days, a week's rest is then given, and if no reaction is set up the patient is exposed 3 to 5 times a week until there is a slight increase in the photophobia, which shows the patient is beginning to react.

About this time the granules generally begin to disappear from the lids; exposures are carried out until they disappear.

When the granules have disappeared all treatment must

be stopped, as it requires some weeks for the infiltration set up by the x-rays to settle down, and it is difficult to tell whether the disease is absolutely eradicated, as the lid remains injected for some time after treatment has ceased.

The final result to the lid is most satisfactory. Instead of the white puckered conjunctiva resulting from other methods, a supple, non-contracted, non-scarred conjunctiva, with no obliteration of the fornices, unless they are already gone before treatment, is gained, similar to the soft supple scar in the skin produced by this form of treatment in rodent ulcer as compared with the dense cicatrix of excision.

As regards the effect on the pannus, it often clears, with great rapidity, especially if recent, and it is a common thing for patients to say they see more clearly almost from the first exposures. But even dense corneal opacities will often clear considerably, and in one case of extensive destruction and cicatrization of the cornea following 30 years' trachoma, in which at the commencement of treatment the patient could only see shadows, in two months she could count fingers three feet away.

Another peculiar point is the amount of exposure required by different patients. Sometimes the granules begin to disappear from almost the first exposure; others require eight to ten or more exposures before showing signs of reaction.

In cases which react only slightly the effect may be increased by the additional application of some one of the other forms of irritant, such as copper sulphate, but great care must be taken in applying them, as they produce much more reaction than when applied to similar cases of trachoma which have not undergone x-ray treatment.

As regards the cases suitable for treatment, the most satisfactory are the chronic cases, and of course the earlier they seek treatment the more rapid and satisfactory the result. These patients will also stand more frequent exposures than any others. Acute diffuse infiltrations with thickening of the lids and much photophobia require more careful exposures, extending over a much longer period. Old-standing cases in which the lid trouble has almost disappeared, but in which there is much opacity of the cornea, will often improve considerably under exposures at long intervals after the first reaction, which should be mild.

The chief advantages of the treatment are :

1. It is painless.
2. There is considerably less deformity of the lid after treatment.
3. The pannus clears more thoroughly.

If a trachoma be examined microscopically whilst undergoing treatment with copper sulphate, it is found that the nodules in the conjunctiva become surrounded by a dense capsule of fibrous tissue, which seems to shut off the nutrition of the nodule in much the same way that a tuberculosis nodule becomes encapsuled: hence the excessive amount of scarring which is produced after treatment by this method.

By the application of x-rays an enormous leucocytosis is set up, which directly invades the nodules, leading to their disintegration with much greater rapidity and without the excessive production of scar-tissue.

Coming to the effects of x-rays on the eyes, it is noticeable that in cases of rodent ulcer in which the eyelids have been destroyed by the disease, and in which the eye has been directly exposed to the action of the rays for periods of 6 to 12 months, 3 to 4 times a week, for 10 minutes each sitting, no serious injurious effects have been produced, the vision remaining the same throughout the treatment, although an intense conjunctivitis was set up. This conjunctivitis is also seen amongst workers with x-rays, and is easily prevented in them by the use of lead glass spectacles.

X-rays have no bleaching effect on the visual purple.

Some thinning of the eyelashes, due to inflammatory changes taking place around the base of the hair follicles, occurred in a few of the cases treated.

The Corneal Lesions of Acquired Syphilis.

STEPHENSON, Sydney, London. (*The British Med. Jour.*, Sept. 26, 1903.) Acquired syphilis may affect the cornea primarily in two different ways: First, as an interstitial, diffuse or parenchymatous keratitis; second, as a true keratitis punctata, first described by Mauthner. "The latter form must be sharply differentiated from ordinary keratitis punctata, which we now recognize as merely a sign of inflammation of some part of the uveal tract—iris, ciliary body or chorioid, as the case may be. Mauthner's punctate keratitis on the contrary, is a primary specific affection of the corneas

It is characterized by groups of circumscribed greyish spot-lying at various depths in the substantia propria of the cornea, absent or ill-developed episcleral injection, rapid development, and equally rapid disappearance. The iris is not involved in the morbid process. The punctate dots are ascribed by Mauthner to a localized gummatous infiltration of the cornea." The writer has failed to find an instance of the second form described in British ophthalmological literature and gives the history of a case of this sort.

It is only recently that the connection between acquired syphilis and interstitial keratitis has been recognized. Stephenson gives an account of the work done by various observers in establishing this relationship. A good many cases, now amounting to about 60, have been published on the continent and in the United States and three additional instances are described in this paper.

"From a study of the literature I am forced to the conviction that this form of keratitis is not so uncommon as the comparatively few cases placed on record might lead one to believe. This view is borne out by the figures adduced by certain authors, which have been incorporated in the following table:

Name.	Reference.	No of Cases.	Due to Acquired Lues.	Per-centage.
Jakolewna	Zurich Thesis	63	2	3.1
Dier	Zeitschr. f. Aug., 1889	—	—	1.9
Haltenhoff	Bull. de la Soc. Fr. d'Oph., 1887	66	5	7.5
Pfister	Klin. Monats. f. Aug. 1890	130	—	3.8
Ancke	Centralbl. f. prak. Aug., 1885	100	10	10.0

These figures are not large, but, so far as they go, they tend to show that from 1.9 per cent. to 10.0 per cent. of all cases of interstitial keratitis are due to acquired syphilis. It is more than merely probable that acquired syphilis is sometimes overlooked as a cause for interstitial keratitis. One is a little apt to forget that acquired extra-genital-syphilis is

not unknown amongst children. The mistake is not so likely to happen in adults, in whom the existence of a unilateral, non-ulcerative keratitis would naturally lead to inquiries as to the existence of the acquired disorder.

Interstitial keratitis is generally considered to be a very late secondary or a tertiary event of syphilis. Comparatively few cases are recorded as occurring under two years from the primary infection, and three only within one year from that event. In the cases collected by me the average period works out at 10.8 years; the longest interval was in a case of Ellett's where it amounted to twenty-three years, and the shortest three weeks in a case reported by Lohnenshon. The latter case is interesting. It was one of bilateral keratitis in a man aged 26 years, where the corneal affection co-existed with a hard chancre on the prepuce, that is, with the symptoms of primary syphilis. In a case of Lawford's again, a unilateral keratitis followed four and a half months after a primary syphilitic lesion of the right lower eyelid, and the patient at the time suffered from a "sore throat." But the specific lesions commonly noted in association with interstitial keratitis include oro-nasal ulcerations, palmar and plantar psoriasis, gummata of the skin, periosteum, and muscles, ozena, deafness, ptosis, facial paralysis, ecthyma, vitreous opacities, and chorioido-retinitis—in short, those symptoms, that are usually included under the name "tertiary." The interstitial keratitis of acquired syphilis, then, is shown to be a tertiary phenomenon by the period at which it generally occurs, and also by its associations in the shape of other tertiary lesions.

Some authors—as, for example, Valude—have claimed that this form of keratitis is, from the clinical point of view, especially distinguished by the fact that it is not so apt to be vascularized as the form associated with the inherited disorder. This claim may be true, broadly speaking, but in my own case the affected eye was at one stage extremely vascular, while the existence of a definite "salmon-patch" has been noted by Lawford and by Fritz Mendel."

A Form of Rational Treatment for Corneal Ulcers.

PHILLIPS, W. L., Buffalo. (*N. Y. Med. Journ.*, and *Phila. Med. Journ.*, Oct., 3, 1903.) The writer discusses briefly the anatomy of the cornea as a basis for explanation of the the-

ory of the treatment recommended; the latter is based upon the structural composition and pathological state of this organ. He states that when the cornea becomes ulcerated there is first an infiltration of a circumscribed area and second, suppuration with consequent loss of tissue. This process irritates the nerve filaments in the cornea and causes the bloodvessels to dilate, which brings more blood to the iris and conjunctiva, allowing the albumin of the blood to escape into the anterior chamber, and making the excretion of aqueous more difficult, with an increase of tension. This increased tension crowds the inner wall of the cornea against the lymph-spaces, forcing them against the outer unyielding coats of the eyeball, nearly obliterating them, destroying nutrition, and robbing the cornea of its resistant power. The increased quantity of blood also causes the conjunctival bloodvessels to spread to the cornea in order to supply the diseased area with nutrition. This vascularization of the cornea produces pressure on the lymph-spaces by decreasing the amount of space in this part. Nutrition suffers because these minute canals present a decrease in calibre, and destruction gradually advances until rupture ensues.

"To treat ulcers according to these pathological conditions we must first aid Nature to overcome the disease. To do this it is necessary to contract the arteries in the conjunctiva and iris; by so doing we check the escape of albumin into the anterior chamber and stop vascularization of the cornea. This will lower tension and restore the nutrition to the cornea by liberating the lymph spaces, and it will also render the deeper structures less liable to infection. To accomplish this I use suprarenal extract.

Secondly, because it is nearly always, if not always, due to a germ, we must render the conjunctival sac antiseptic with some mild preventative, such as boric acid.

Thirdly, we must build up the lymph corpuscles to a healthy condition to bring about resolution, for one of the predisposing causes of ulcer is a lack of resistance, that is anemia, which may be local or general. For this I use nuclein solution, 5 per cent. (the hypodermic solution being less irritating). The disease should also be treated constitutionally.

Fourthly, we must treat the conditions which have a bearing upon this disease, for a great many times ulcers have

their origin in other diseased parts, such as caries, adenoids, hypertrophies of the turbinates, etc.

In using this treatment the suprarenal must be dropped into each eye three times a day, and as the severity of the disease increases, the medicine must be instilled oftener, up to ten times a day, depending upon the absorption of the drug and its action on the heart. The eye should be kept clean with warm boric acid solution and the nuclein solution should be combined with, and given in the same way as the suprarenal."

The writer gives the histories of a number of patients suffering with ulcer of the cornea in which this form of treatment was used with very satisfactory results. He reviews the other and older methods of treating this affection and mentions objections to them which he claims do not apply to the method advocated.

Knee-Jerk Phenomenon in Interstitial Keratitis (Congenital Syphilis), with a Scheme for Standardising the Variations in the Phenomenon.

HARMAN, N. BISHOP. (*The Ophthalmic Review*, Sept., 1903.) The writer investigated the knee-jerk phenomenon in 100 cases of interstitial keratitis (congenital syphilis), having been led to make such examinations as a result of the published findings of Lang and Wood (*Ophth. Hos. Reports*, 1888, 312). These workers investigated 62 cases and found: "1. That in about 30 per cent. of all cases of interstitial keratitis the knee-jerk is decidedly abnormal. 2. That in about 10 per cent. of all cases it is entirely absent—all known cases of subnormal tendon reflex, outside of the constant fact that the local eye disease exists, having been eliminated. 3. That it is rare to find a case of exaggerated patella tendon reflex in interstitial keratitis when unaccompanied by some of the affections known to produce the former."

Harman considered the establishment or correction of these conclusions as of some importance; the presence or absence of the knee-jerk phenomenon being a matter of no small count, since it is regarded as an index of the state of certain portions of the nervous system. The absence of this phenomenon in a large percentage of patients suffering from definitely ascertained results of inherited syphilis would imply that they also suffer a particular deficiency in the condi-

tion of the conducting paths of their nervous impulses; or else the absence of the phenomenon being proved, without the existence at some time or other in their history of any special liability to this nervous derangement, would throw some discredit upon the diagnostic value of this hitherto important sign.

The ordinary method of crossing the knees not appearing to be satisfactory for comparative examination of the knee-jerk phenomenon, the writer adopted a method which he found simple, easily repeated and giving uniform results: "The patient is seated comfortably in a chair of such height as will allow the thighs to rest on the seat and the feet to be evenly planted on the ground directly below the knees. The patient is then directed to look at and point with both forefingers toward some mark upon the ceiling. The hand of the examiner then grasps the quadriceps extensor cruris of the limb to be examined in its fleshy part, and after feeling the exact position of the yielding patella tendon, a tap is administered to the tendon with a thin hard-edged book or piece of mill-board. It is obvious there must be a reasonable uniformity in the "tap" administered to the tendons. The best form seems to be produced by an easy swing of the hand from the wrist. The degree of tap I arrived at by using such force as when the blow was administered to the back of my own, or another's clenched hand, was just short of producing sharp pain. As a weapon I mostly used a piece of mill-board, the cover of a test-type. It weighed five ounces, measured $8 \times 6 \times 1\frac{1}{4}$ in., and when the tap was brought down on to the pan of a spring balance, the scale registered one and a half pounds."

The variations in the degree of reaction are classified as follows: Absent, reinforced, normal, subnormal, brisk, exaggerated, and violent. In a large number of cases (41 per cent.) the condition of reaction was examined on several occasions at intervals extending over eight months and no noticeable variation found. In all 100 consecutive cases (40 males and 60 females) were examined; of these 19 were in the state of an initial acute attack. 16 were suffering acute or subacute relapse, and in 65 the manifestation was in a state of quiescence. As a standard of comparison, he examined an equal number of healthy individuals, choosing the same number of each age and sex found amongst the diseased.

The result of these investigations are given as follows: "The table of results shows that there is no noticeable difference between the condition of the phenomenon in the subjects of constitutional syphilis and in healthy folk, indeed the figures are surprisingly alike. In 75 cases of disease the reflex was "normal", in health 74, whilst there were a fair number of both brisk and exaggerated reactions. The similarity of the results is rather broken if the reactions of males and females be taken separately. In disease the relative proportions of the condition of the phenomenon remain nearly the same as for the totals of both sexes, but in the reactions of health there is a considerable difference. The reactions in healthy males are very steady, as many as 90 per cent. being "normal," whilst the females show much variability, only 61.6 per cent. are "normal," 10 per cent. are subnormal, and 20 per cent. are brisk. I am not aware that this variability of the phenomenon in healthy females as compared with males has been noted before.

A comparison of the condition of the phenomenon in the varying states of the diathesis, in acute attacks, relapses, or in quiescence of the manifestation, or when under specific treatment or otherwise, does not show any noticeable differences."

Keratoconus, Etiology, and Importance of Early Diagnosis and Treatment.

BRADFIELD, J. A. L., La Crosse, Wis. (*Amer. Journ. of Ophthalm.*, October, 1903.) The writer comments upon the meagreness of the articles in our text-books on the subject of keratoconus; he is convinced that the condition is of much more frequent occurrence and of more importance than generally considered. The subject is dealt with from the standpoint of his own experience and is limited to typical keratoconus characterized by ectasia of the cornea just below and to the inner side of the optical center. The condition is defined as a disease originating at puberty, characterized by asthenopia and gradual falling of vision both far and near, occurring more frequently in females, usually binocular, and often originating in the hyperope. In many cases it soon reaches a stasis and leaves only a slight irregular astigmatism; in other and more serious cases it results in great irregular astigmatism and low vision; in exaggerated

cases, it causes a well-marked cone protruding between the lids and almost blindness. Sometimes existing in rhachitic subjects, it is oftener found in nervous, chlorotic individuals with some systemic fault, the nervous phenomena of puberty being the most important. The specific etiology is unknown. Tension is normal. The thinning results from increase in area and corresponding thinning of the cornea; the general nutrition of the eye being at fault, the tonicity of the cornea is insufficient to resist the normal intraocular pressure, and hence the portion of the eyeball least protected by lids and extrinsic muscles (the point just below and to the inner side of the center of the cornea) gives way.

"When the process has once begun the error of refraction resulting therefrom, causing increased effort at accommodation, increases the progress of the disease, which, if the cause is not removed, hastens the eye to destruction.

When the disease is well advanced the diagnosis is easily made by the dark disc [in the pupil reflex, the small and irregular corneal reflex or the irregularity of the rings in Placido's disc. When the ectasia becomes a staphyloma it can easily be seen, as it protrudes between the lids.

As the success in treatment depends on an early diagnosis which is very easily omitted, finer points in diagnosis must be found. As the center of the ectasia always occurs to one side of the optical center of the cornea, astigmatism is always present and also the meridians of least and greatest curvature are not at right angles. It is here that the ophthalmometer is invaluable. It not only shows the astigmatism, the variations from right angles of the principal meridians but the variations with different stages of dilatation of the pupil and the course of the disease whether progressing, retrograding, or at a stasis.

When vision and refraction are found to vary with different sizes of the pupil, accompanied by variation in the location of the axes of the cylinders, keratoconus should be suspected and can only be confounded with keratectasia resulting from corneal lesions, the history of which is generally sufficient to determine the diagnosis; but when not, a little time and careful observation will do so.

With an early diagnosis and appropriate treatment, prognosis is good, the disease not only being brought to a stasis but considerable ectasia reduced to normal cornea. When

more advanced, much improvement can be made, but vision will not be brought back to normal with correction of refraction, and ocular weakness will always remain.

When well advanced and the ectasia has become a perceptible cone, treatment is still very valuable, but the preservation of good and comfortable vision is not possible.

Treatment should begin by correcting any errors in the general health and following good hygienic principles. Second, rest of the eyes from all use requiring prolonged accommodation. Third, correction of errors of refraction by appropriate lenses. Here care and judgment is required, as the refraction will vary very greatly with the different stages of dilatation of the pupil. The proper glasses should always be determined without the use of a mydriatic, care being taken to have about the same degree of light correspond to that in which the patient will work. Owing to contraction of the pupils in accommodation, sometimes very different lenses are required for distant and near use. In the early stages, when the ectasia is progressing or retrograding, frequent changes of the lenses will often be needed. Plus cylinders are usually but not always best.

In the early stages before the cornea has become very much thinned, local applications of the crystal of alum should be made to the affected portion of the cornea. After cocaineization, a smooth piece of alum should be gently passed over the cornea from one to six times, as experience teaches. This leaves a very soothing sensation and should be continued from once a day to two or three times a week till the ectasia is reduced or no longer improves. If after treatment is stopped the ectasia should return, the same treatment should be continued.

In the more advanced stage when the cone becomes visible and the center thinned, myotics and iridectomy are useful, but cauterization, penetrating the entire thickness of the cornea is much more valuable, subsequently making iridectomy where it will give the best optical results."

Notes on Operations for Conical Cornea.

MORTON, A. STANFORD, London. (*British Med. Journal*, September 26, 1903.) The treatment of conical cornea is generally recognized as being beset with much difficulty; various methods giving varying results have been suggested

and tried. In this paper operative treatment is considered as applying to cases which are not otherwise sufficiently improved. The object of the operation is to produce such a flattening of the cornea as will result in useful vision. The operations chiefly in vogue to attain this end are: (1) cauterization without perforation, (2) cauterization with perforation, and (3) excision of the apex of the cone. In view of the paucity of statistics giving full details of series of cases treated by these three methods, the data available are scarcely sufficient to allow a decision in favor of either operation.

Desiring to contribute towards this end, the writer records in detail all the cases of which he possesses notes subsequently to the operation. He gives (1) V. without and with glasses before operation; (2) V. without and with glasses after operation; (3) permanence or otherwise of the result as shown by a comparison of V. just after the operation and again at a later date; and (4) the complications attending operation. Cauterization was employed but four times, in the large majority of cases, the operation performed having been excision of an elliptical piece from the apex of the cone; this operation was performed 26 times and is described as follows:

"The apex of the cone is transfixed by a large, narrow, and stiff Græfe knife whose edge is turned forward and a little to the right. The knife is pushed steadily onward until it cuts its way out through the cornea to the right of the cone, thus forming one edge of the elliptical piece to be excised. The flap thus formed is held well up by its free edge with fine forceps. The knife thus being passed beneath the point of these forceps, cuts out on their left side through the corneal tissue, and so completes the excision of the elliptical piece, about 2 mm. by 1 mm., containing the apex of the cone. Excision of the apex may be performed in the vertical or horizontal meridian, or in the meridian of least curvature. There is perhaps not very much choice as between the vertical and horizontal incisions though, possibly, with the former, the wound is more under cover of the lids, and therefore less disturbed, than a horizontal incision which might be just in the line of the palpebral aperture."

"From a perusal of the notes it will be seen that operations for conical cornea are certainly not devoid of risk and

should therefore be undertaken only when other means fail to give the desired vision.

Complications of Operations.—As the following cases show, the dangers attending excision of the apex are (a) anterior synechia, (b) iritis and posterior synechia, (c) increased tension, (d) hypopyon. In cauterization with perforation there are the same risks, and though in cauterization without perforation these are minimized, yet in one case which came under my observation there was increased tension requiring treatment.

Treatment of Complications.—In order to avoid as far as possible the risk of anterior and posterior synechiæ, the eye should be well under atropine, and care should be taken to avoid extending the incision too far, especially in the downward direction. After the operation ung. atrop. should be freely inserted with as little disturbance as possible of the lids. Increased tension is seldom met with except as the result of the anterior synechia. If anterior synechia occurs it may be dealt with by Lang's knives or iridectomy. Iritis will be treated in the usual way, and, should troublesome posterior synechia supervene, iridectomy is indicated.

Choice of Operation.—It is difficult to specify the indications in favor of one or the other method of operating. Should the cone be only slightly prominent, and especially if situated toward the outer side of the cornea, cauterization would seem to be indicated rather than excision of the apex. Where complications already exist in the eye to be operated on, such as a pupil contracted and fixed by iritic adhesions, one would probably use the cautery without perforation, as being perhaps less risky.

Cautery, with perforation, and excision of the apex appear to involve about the same amount of risk. The scar, however, of the cautery is probably generally more extensive than the linear scar of the excision, and therefore leaves less cornea clear for visual purposes.

Preliminary Iridectomy.—This has occurred to me as likely to obviate to some extent the occurrence of anterior synechia when the cornea is perforated. I am not at all sure, however, of its advisability, for on several occasions I have noticed how much worse the vision was while the pupil was dilated by atropine than afterward. Then on re-instilling atropine the vision was generally materially lessened, so

that it seemed as if the narrow fissure between the scar and the pupillary border was an advantage which would have been lost had iridectomy been performed.

Perforation or Non-Perforation.—Flattening of the cone is the object aimed at, and this is certainly best attained by perforation. Whether, however, the advantages gained by the extra flattening thus obtained are more than counter-balanced by the risks incurred, and whether the perforation should be effected by the knife or the cautery, are points on which it will be easier to form an opinion when we have at disposal more statistics giving full details of complete series of cases treated by the various methods."

A table giving a summary of the operations and the histories of cases is appended, and finally an analysis of the results of operation in 13 patients (20 eyes). The V. of these eyes before operation, without glasses, varied from fingers at 6 inches to 6/36—the average being 17/200; 14 of these eyes were not improved with glasses, and in 6 cases the V. was improved on the average from 4/60 to 6/60 +. After the operation V. averaged 13/60 without glasses, and 15/36 with glasses.

Some Observations upon the Pathogenesis of Rheumatic Iritis.

POYNTON, F. J., London. (*Ophthalmoscope*, October, 1903.) The author and Dr. Paine, "in rheumatic fever isolated from the cardiac valves, pericardial exudation, and rheumatic nodule after death, and from the blood, tonsils, synovial fluid, and urine during life, a minute diplococcus. This can be cultivated outside the body and can be found in the local lesions of the disease, as, for example, in the nodule or cardiac valve. Further, it will produce identical lesions in rabbits, and the micro-organism can be demonstrated in those lesions. Lastly, in rare instances—two in our experience—iridocyclitis of one eye has resulted in rabbits as a result of the intravenous injection of the organism into the auricular vein.

On both occasions the animals died of heart disease and we found iridocyclitis with plastic exudation, and in the anterior chamber a cloudy fluid which contained a few leucocytes and which teemed with the diplococcus. A culture from this fluid injected into another rabbit produced a chronic arthritis, from which the animal eventually recovered. This micro-organism we believe to be a cause of rheumatic fever,

and thus it follows that *we look upon the iridocyclitis as a true experimental rheumatic iridocyclitis.*

Rheumatic fever viewed in this way at once finds its position among diseases. It becomes one of that group of micrococcal infections, in which we place the pneumococcal, the gonococcal, the staphylococcal, and the streptococcal diseases. All are characterised by numerous local focal lesions, but each has a certain stamp of its own. Clinicians have long claimed a position of this kind for rheumatic fever, but they are not all satisfied that rheumatic fever owns only one bacterial cause. However this may be, judging from these experimental results, we should expect in man, as in rabbits, a true rheumatic iritis. From the rarity of its occurrence in the animals, overwhelmed as they were by a sudden intravenous injection, we should expect it to be rarer still in man, who has a greater resistance, and who is seldom or never overwhelmed by the infective agent as was the case with the animals.

This is the inference that may be justly drawn from the investigation, but to be of practical utility it must be tested by clinical experience. In the first place, I believe I am right when I state that iritis occurring in direct relationship to rheumatic fever, although very rare, is not unknown. Then, again, there are a considerable number of cases of iritis in which it is true there is no absolutely direct relationship to be traced, but in which the evidence that the patients have formerly suffered from rheumatic fever is convincing.

Thirdly, as a physician, one recognises clearly that chorea may be for years the only sign of rheumatic fever, even perhaps remain the only sign, and the disease be vanquished. It has taken a long while to realise the truth of this, but now it is recognised we may justly apply the same reasoning, with caution, to iritis, and suppose that this also may be a solitary manifestation.

Lastly, that the other infections allied to rheumatism may produce iritis is also known. The gonococcal, the pneumococcal—which, as in other pneumococcal lesions apart from the lung, is liable to suppurate and become a suppurative panophthalmitis—and the streptococcal infections. All may cause iridocyclitis, and the micro-organisms be demonstrated in the eye. The clinical evidence of true rheumatic iritis appears then convincing.

There is, however, because it is usually recovered from, difficulty in the study of rheumatic iritis. Secondary effects from adhesions may follow, but the active disease subsides, and if it should be a part of a general rheumatic fever that, too, is usually recovered from. So it comes about that bacteriological investigations, difficult enough to make, at the best, may be repeatedly negative.

In this form of iridocyclitis the diplococcus escapes from the minute blood vessels of the ciliary body and iris into the delicate supporting connective tissue. Then it gives rise to swelling of this connective tissue, perhaps necrosis and cellular and fibrinous exudation. The epithelium on the anterior surface of the iris is actively phagocytic, but when it is destroyed by the disease the micro-organisms make their way freely into the fluid of the anterior chamber, and may grow in masses on the anterior surface of the iris. With recovery there is destruction of the diplococci by the living cells, and some adhesion and scarring often results, but whether or not in some cases the diplococci may remain latent but not destroyed we have not ascertained in this condition of iridocyclitis, although it does occur, we believe, in other rheumatic lesions."

Idiopathic Myositis Involving the Extraocular Muscles.

GLEASON, Ann Arbor, (*Ophthalmic Record*, October, 1903.) "Inflammation of muscles, not due to traumatism or propagation from neighboring parts, so rarely comes under the observation of the medical profession that the report of such a case cannot fail to be of interest. It is only during the last ten or fifteen years that attention has been drawn to this important condition, and in all only some thirty-five cases have been reported. Among these I have been unable to find any similar to the one to be presented here, which involved primarily and exclusively the orbital muscles." And a case is reported occurring in right eye which was enucleated; a pathological diagnosis of acute interstitial myositis of the superior rectus was given. At this time the left eye was perfectly normal. Two months later the left eye commenced in a similar manner, and was enucleated after a month's treatment. The findings were such as to prove conclusively that the myositis was the primary condition. All the muscles of this eye were involved similar to that of the superior rec-

tus of the right eye. No involvement of the cellular tissue of the orbit was demonstrable.

When first seen, vision was O. D, 15/lx, O. S. 15/xxx, but the left became perfectly blind from inflammation, due to the exophthalmos produced by the inflamed muscles. Preceding and accompanying involvement of each eye was a severe attack of rheumatism.

That it was a true primary idiopathic myositis is probably true for two reasons. "First, in the right eye the only muscle involved was the superior rectus. From direct extension of inflammation from Tenon's capsule, we would expect all the muscles passing through it to be involved equally; second, myositis resulting from an idiopathic tenonitis has never been seen in any of the reported cases of this affection. No other local conditions such as osteomyelitis, periostitis, or cellulitis was present to account for the condition.

Etiologically idiopathic myositis is closely related to acute periostitis, spontaneous acute osteomyelitis and acute rheumatic arthritis. Similar causes predisposing, there is in each of these conditions an acute inflammation which in the different diseases localizes itself in the different tissues. The nature of the etiological factor of myositis is unknown.

Although by their position the extraocular muscles are not liable to secondary inflammation in articular rheumatism, it seems probable, as Wright has recently called to attention, that they are liable to be the seat of a muscular rheumatism, and there seems to be no reason why they should be immune to other diseases of muscles."

Extract of Cataract in Capsule.

SMITH, HENRY, India. (*The British Med. Jour.*,) Sept. 26, 1903. The writer points out that extraction of cataract in the capsule was practiced in the early days of cataract extraction on the continent of Europe but has fallen into disuse, the generally accepted view at present being that although it is an ideal method of operation, it is only safe under exceptional circumstances. The writer attempts to show in this paper that this operation is not only theoretically an excellent one, but that it possesses great practical utility and that there are but a few circumstances under which it is not advisable. In India it is made a systematic operation by Mulroney and the writer hopes that it will be firmly established in India before many years.

The details of the operation which he performs are the writer's own. "My personal experience extends to over 8,500 cataract extractions. Of these, about 2,000 were performed by the orthodox method of scratching the capsule and leaving it behind, and about 6,500 were extractions in the capsule. Those extracted by capsulotomy were, generally speaking, my earlier operations. In them, when a nervous patient was operated on under cocaine, it occasionally happened that when the incision was made, before there was time to take out the speculum, the patient by screwing up the orbicularis muscle put pressure on the eyeball and shot out both the lens in its capsule and a quantity of vitreous. I was agreeably surprised to find that these cases generally turned out well in every way. The observation of this accident and its results induced me to perform extraction in the capsule as a systematic operation, modifying details as experience dictated.

Table of Results of Cases submitted to Extraction in the Capsule at Jallundhar Civil Hospital from Jannary 1st, to May 1st, 1903.

Num-ber.	Iritis.	Escape of Vitreous.	Capsule Bursting.	Capsule Left Behind.	First-class Results.	Second-class Results.	Third-class Results.
1,023	Per Cent. 0.19*	Per Cent. 6.6	Per Cent. 8	Per Cent. 4	Per Cent. 99.42	Per Cent. 0.19	Per Cent. 0.39

Preliminary Inspection of the Eye to be Operated on.—The trained eye of the surgeon, aided only by the fingertips, will supply more information than all the instruments that have yet been devised for this purpose. The patient's eye can be properly inspected only when he is lying on his back in a good light, from which the direct rays of the sun are excluded. The appearance of the sclerotic, the lustre of the iris, the position of the iris, the position of the lens, and the reaction of the pupil to light will reveal to the naked eye all that is required as far as cataract is concerned, except in the very rarest of circumstances. The reaction of the pupil to light is almost as

*Occurred in cases where the capsule was left behind.

accurate an indicator of the visual acuteness of the retina as the galvanometer is of an electric current.

For practical purposes, and having regard only to the operator's point of view, I classify cataracts as follows:

I—In children.

(a) Soft, that is, of milky consistency.

(b) Gelatinous, that is, of gelatinous consistency.

II—In [adults.

(a) Hard.

(b) Semi-soft, that is a core surrounded by juice of milky consistency.

(c) Semi-gelatinous, that is, a core surrounded by material of grapejuice consistency.

(d) Atrophic.

The operator, before he has made his incision, can diagnose each of these varieties with accuracy, hence the importance of the classification. Cataract in children and atrophic cataract are not suitable for extraction in the capsule. In the semi-gelatinous variety the lens occasionally has a peculiar blueish tinge. These cases, also, are unsuitable for extraction in the capsule, for the capsule is weak and liable to become ruptured during the operation, allowing the core and lens matter to escape; and if the surgeon be not dextrous, it will retract, together with some lens matter, so that the ultimate effect on the eye is no better than if the operation had been performed by scratching the capsule.

Out of 1,083 cataracts operated on by me during the first four months of the current year I decided that 60 or 5.5 per cent. were unsuitable for extraction in the capsule. Thirty-one of these were in children and 29 were in adults so that among the adults I excluded 2.7 per cent. from this operation. Having decided that the case is suitable for extraction in the capsule, and the usual preliminaries having been gone through, I make a liberal sized upper incision, inserting the knife at the sclero-corneal junction just as deep as anatomy and experience teach us will avoid wounding the dangerous area, and cut out in the cornea with a sweep half way between a normal pupil and the sclero-corneal junction. I then take out the speculum, and my assistant hooks up the upper eyelid on an ordinary large-sized strabismus hook, and draws down the lower lid by placing the ball of his thumb on the skin of the face close to the lower eyelid. He lifts the

upper lid well up with the] strabismus hook, and relaxes his hold on neither the upper or the lower lid until the operation is finished. It is important that he should lift the upper lid well up and retain the lower one so well down that the orbiculis muscle cannot be brought into action by the patient until the operation is finished. The importance of a thoroughly competent and reliable assistant in this matter cannot be over estimated.

Assuming that the operator is skilled in ophthalmic manipulation, it is the free action of the orbicularis muscle in almost all cases which causes escape of vitreous. I consider it of supreme importance to impress this fact upon any one at tempting the operation. I then place the curve of a strabismus hook over the cornea about the junction of the lower with the middle third of the lens, and a spoon just above the upper lip of the wound. I press the strabismus hook down neither toward the wound or from it, and do not alter its position until the lens is nearly out, all the time making slow, steady, and uninterrupted pressure and counter pressure. When the lens is more than half way out I, while keeping up the tension with the spoon in its original position, shift the strabismus hook forward, and gently tilt the lens by getting the edge of it in the concavity of the strabismus hook. If this latter maneuver be done with the spoon or other comparatively sharp instrument, or with the slightest roughness or jerk, the capsule will give way and allow the body of the lens to escape, and if the operator be not dextrous will itself retract with some contained lens matter, and being in part dislocated will give trouble in its removal. I shall deal with the removal of such capsules later on.

The lens in its capsule being out the eyelids are let go and bandaged up with the usual antiseptic pad. If a trace of vitreous have escaped it is snipped off with scissors, and if the iris prolapses it is replaced before the eyelids are let go. In the case of non-iridectomy extractions the slow, steady strain of the lens on the pupil tires out the muscle of the iris and the pupil gently relaxes as the muscle tires. There is no advantage in a preliminary instillation of atropine. I have frequently thus extracted the lens in its capsule in opium-eaters, in which the pupil was contracted with opium, without atropine and without difficulty. This slow, steady proceeding also allows time for the lens to become gently dislocated. The

operator who attempts to extract the lens in its capsule either with or without an iridectomy, as rapidly as is done when the capsule is scratched, will have disastrous results. By over-rapid expression the capsule will burst. I find that the whole operation takes from two to three minutes—twenty to thirty cataracts in the hour. The only sponging, washing or douching I use is a preliminary washing out of the conjunctiva with a 1 in 2000 perchloride of mercury solution.

After the lens in its capsule comes out, if we go "fiddling" we are sure to have an escape of vitreous. The lids on closing are quite sufficient to drive out any fluid there may be, vitreous or other, except blood. Blood should not escape in a cataract operation beyond the merest trace, which can be neglected. The operation I perform with an iridectomy differs in no way from the above, except in the iridectomy. The corneal wound I make is very little larger than is necessary for the safe extraction of cataract by the ordinary method. I have before called your attention to the capsule giving way when the lens is partly out. Of the 1,023 cases submitted by me to extraction in the capsule in the current year the capsule gave way in 8 per cent. In half of these I was able to catch the capsule hanging out of the wound with its contained lens matter, thus leaving the capsule behind in 4 per cent. of the cases. This is the most serious complication in this form of operation. The operator at this juncture should keep up sufficient pressure with the strabismus hook in his right hand to prevent the capsule retracting, and lifting an ordinary dissecting forceps with his left, he should catch the capsule and bring it with its contained matter with him. If the capsule have retracted, we should try by gentle stroking to press out its contained lens matter—this the experienced operator will generally succeed in doing—and if the capsule be evident to the eye we may make an attempt to catch it with an iris forceps and fetch it out. If we cannot do this latter by one or two careful attempts we should desist and watch events.

Escape of vitreous, so much dreaded, though not a desirable thing, I have seldom seen evil consequences from. In the 1,023 cases under consideration, escape of vitreous amounted to 6.6 per cent., and in only one of them did I see evil consequences attributable thereto. Cases in which the amount of escape has been small seem to do just as well as others. The vitreous seems to repair as well as any other

tissue, and why should it not? The place of escaped vitreous is either taken by aqueous humour or is renewed, and the tension of the eye does not seem to suffer unless the escape be considerable. The cases noted in the table in this paper had, with three exceptions, only a bead of vitreous escape. The three exceptions were in supremely nervous patients who shot out the lens and a quantity of vitreous the moment the incision was completed. Two of them turned out well, and one was completely lost. It may be noted that the accident in these three cases would have occurred in any operation.

The statistics also include the extration of some 35 cases of lenses couched by the *rawal* (the native ophthalmic quack operator of India), and in these we are a little more likely to have escape than in ordinary plain-sailing cases. When the lens is halfway out, or much earlier in the case of couched lenses, a clear point of vitreous will occasionally appear in the wound behind the lens. It is due to the fact that the capsule is unusually strongly anchored in part and refuses to give way. The moment this clear point appears behind the lens when it is being expressed, the spoon in the left hand which has been making counter pressure should be lifted, the strabismus hook in the right hand keeping the lens in position. The spoon should be pushed beneath the lens through the clear point and the lens suspended on it. Once the lens is supported on the spoon the strabismus hook can be used as before to drive out the lens, the spoon merely coming with the lens but not drawing it out. It will be observed that I use the spoon for the purpose of supporting the lens and preventing it from putting pressure on the vitreous. If we attempt to lift out the lens on the spoon merely, the capsule will give way with exceeding frequency. The maneuver I recommend is in practice an easy procedure and prevents undue escape of vitreous.

Visual Results.—Owing to pressure of work, neither I nor my reliable assistant have time to test systematically the vision of every case when leaving hospital, as the Jallundhar Civil Hospital is not merely an ophthalmic but also a large general surgical hospital, in which there are but two native qualified assistants. On slack days we have time to go into details as regards visual results. The visual acuteness of cases extracted in the capsule is far ahead of what I used to

have when I scratched the capsule and left it behind. With about 8 D. lens—testing for long range—I find that about 30 per cent. of the patients can count the military test dots at a distance of from 40 to 57 feet (the normal maximum being 57 feet), about 60 per cent. between 20 and 40 feet, and the remainder being 10 and 20 feet. The cases of 10 and 20 feet were generally regarded at the time of operation as cases of low visual acuteness due to chronic retinal changes. To count the military test dots at a distance of 15 feet is all that is required of recruits for line regiments of the British regular army.

Iritis.—982 cataracts of the 1,023 cases under consideration were extracted in their entirety in the capsule. In the remaining 41 the capsule had to be left behind. In these 982 cases I had not a single case of iritis. In the 60 cases in which the capsule was scratched and deliberately left behind, and in the 41 in which I was obliged to leave it behind iritis occurred proportionately distributed to the extent of about 5 per cent. In these 982 I had four absolute failures. The details are as follows: (a) Suppuration, 1. (b) Hemorrhage from the fundus, 1. (c) A nervous patient shot out the lens in capsule and a large quantity of vitreous just on completion of the incision; eye wasted. In the remaining 101 cases I had two failures: (a) hemorrhage, 1; (b) suppuration, 1.

The cases extracted by me this year were all done with an iridectomy, hence the absence of prolapse of iris. In previous years I did this operation systematically without an iridectomy unless in exceptional cases. It will be observed that iritis does not follow when the lens is extracted in its capsule, and here I do not draw a distinction between irritation of the iris and iritis: I call them both iritis. My former experience of extracting the lens in its capsule without an iridectomy led me to the same conclusion. It is generally held that iritis following cataract extraction is largely due to bruising of the iris by the lens when it is escaping, and this is also advanced as the reason why iritis follows more frequently in cases in which an iridectomy has not been done than in cases in which an iridectomy has been done, the bruising of the iris being necessarily greater. This is, in my opinion, entirely beside the mark. If extraction of the whole lenticular body in its capsule is not followed by iritis,

then it follows that bruising of the iris has no connection with this iritis. The iritis following cataract extraction is in my opinion due to the fact that lens matter and capsule have been left behind. Why it follows oftener when no iridectomy is done than when an iridectomy is done is due to the fact that it is more difficult to get the last traces of lens matter out of an eye in which an iridectomy has not been done than out of one in which it has been done, and as a consequence it is more often left behind.

Macnamara says, "The greater my experience in these matters the more convinced I am that most of our failures in extaction are due to the fact of soft lenticular matter and capsule being left in the eye after removal of the lens;" and Richardson Cross says in the article before referred to. "After extraction of a lenticular cataract there will always remain some fragments of altered lens or capsule as a record of the operation."

With both of these remarks I entirely agree. By extraction in the capsule we practically eliminate iritis and the possibility of after-cataract, both of which are serious complications. Dealing with an after-cataract is at least as serious as the extraction of the lens in its capsule *de novo*. It will also be admitted that the vision is necessarily more acute than when the capsule is left behind and than when iritis has occurred. No instrument or douche need to be inserted to remove lens matter, and thus manipulation in the interior of the eye is reduced to a minimum. There is no friction applied to the cornea, and hence the minimum of injury is done to its epithelium. As to its drawbacks, I know of none which is not capable of being overcome by experience. I may add that extraction in the capsule is not an operation for the inexperienced. In the hands of a skilful operator extraction in the capsule is at least as much in advance of the ordinary operation as litholopaxy is of lithotomy in the case of stone in the bladder."

How to Avoid Secondary Operations After Cataract Extraction.

BARCK, C., St. Louis. (*Amer. Journ. of Ophthalm.*, Oct., 1903.) The writer summarizes the various procedures which have been employed in dealing with the capsule in the operation of extraction of cataract, for the purpose of avoiding the necessity of a secondary operation. He recommends two

crescentic shaped incisions of the capsule. "The first incision is of crescentic shape, commencing laterally from the lower end of the vertical meridian; the second one commencing just as far mesially from this, meets the first somewhat above the center of the capsule. It is very important that the two incisions really intersect. If correctly carried out, the lower triangular flap as a rule falls downward, and the upper portion retracting, leaves a clear central pupillary area. In a number of instances the remnants of the capsule placed themselves so that they just filled out the coloboma left by the iridectomy; such a result is of course beneficial, both from a cosmetic as well as from an optical standpoint. In 5 of my last 50 cases, I had to make a discission—that is in 10 per cent. In two of these, the extraction had been followed by iritis causing a closure of the pupil; in the third, the patient had been dismissed with good vision, but some months afterward a severe infectious disease was followed by an iritis and in consequence of want of proper treatment, by a closed pupil. The number of cases, therefore, where the obstruction was due to the capsule alone, is a very small one. After these very satisfactory experiences with this form of incision, I feel justified in recommending it for further trial."

Radical Cure for Blennorrhea of the Lacrimal Sac.

SNYDACKER, E. F., Chicago. (*Chicago Med. Recorder*, Oct. 15, 1903.) Snyder reviews the pathological conditions present in these cases of chronic inflammation of the lacrimal sac, notes the dangerous complications which may arise in presence of the purulent discharge, reviews the treatment, gives indications for the operation of removal of the sac and describes two types of radical operation, and endorses the following: He starts the incision above the internal canthal ligament and carries it downward, two or three mm. anterior to the crest of the lacrimal bone, for a distance of two and a half to three cm. The incision extends through the periosteum to the bone. The periosteum is then raised with an elevator down into the lacrimal fossa, and the nasal and posterior surface of the sac, together with the periosteum, is raised as far as the beginning of the lacrimal canal. The superior portion of the sac is then separated from its attachment to surrounding tissues by means of scissors. The sac

and periosteum is seized with forceps and drawn up so as to cut the sac off as low down and as near the beginning of the canal as possible. The beginning of the canal should be curetted so as to make good drainage into the nose. Wound is sutured and pressure bandage is applied.

In this operation the importance of a large incision is emphasized.

Surgical Treatment of High Myopia.

WURDEMAN and BLACK, N. M., Milwaukee. (*Jour. Amer. Med. Asso.*, November 28, 1903.) "Out of 7,160 eyes refracted under a cycloplegic there were only 282, or 3.9 per cent., of simple myopia; and including simple myopia, myopic astigmatism and compound myopic astigmatism there are only 1,209 eyes, or 16.9 per cent., with myopia. Of the total number of eyes refracted, 8,776, there were only 78 eyes of myopia over 10.00 D. (0.888 per cent.) Operation has been suggested in 4 instances and accepted in 3 (6 eyes), and the result in the 6 eyes operated on has been extremely satisfactory, although each operation was much more complicated than ordinary cataract extraction."

The advantages obtained are: "(1) Increase in the visual acuity; (2) enlargement of the retinal images; (3) enlargement of the visual field; (4) increased range for near work; (5) the wearing of light lenses instead of heavy strong spheric lenses in a combination which permits of clearer and less distorted retinal images; (6) the pupil being brought nearer the retina the eccentric visual rays are more excluded; (7) and most important, the more extended use of the eyes obtained by the patients; in all cases a new world having been opened to their view. Detachment of the retina has not occurred in any of these cases, and even if it should happen, the German statistics show that its occurrence is only in 5 per cent. and this is the percentage of cases of high myopia in which detachment occurs without operation."

RESUME.

"1. Surgical treatment of myopia should be limited to those cases over—12.00 D. who suffer great inconvenience from their correcting lenses. The ideal cases for operation are those of—17.00 to —18.00 D.

2. The operation is mainly indicated in young adults.

3. Cases having active disease and changes in the ocular structures, such as progressive myopia, chorioiditis, fluidity of the vitreous or detachment of the retina are not applicable.

4. The dangers of operative interference are more than counterbalanced by the results to be achieved, which are mainly, increase of visual acuity and of the visual field, and more extended use of the eyes which accompany diminishment of the refraction."

The Cause, Prevention and Management of Myopia.

CLAIBORNE, J. H., New York. (*Jour. Amer. Med. Asso.*, Nov. 28, 1903.) The writer sums up his views as follows:

"1. Myopia is a condition in which there is an increase in the anteroposterior diameter of the eyeball. This condition is, except in very rare cases, acquired. It is a distinctly vicious process, and in the great majority of cases tends to increase. It should, therefore, be regarded as a disease. It usually begins in childhood.

2. Its causes may be divided into predisposing causes and a direct cause.

3. (a) The predisposing causes are, in general terms: Heredity, naturally lax conditions of the eye tunics in certain individuals; the injudicious use of the eyes after sickness, usually in children, after the exanthemata; bad illumination, improperly placed illumination, incorrect position in the act of reading; the existence of refractive errors, generally astigmatism, which is uncorrected or improperly corrected; corneal opacities; any systemic condition which tends to produce cerebral congestion, for example, constipation.

(b) The direct cause is an elongation of the eye on its anteroposterior axis, at the posterior pole, except in the case of corneal astigmatism.

4. When myopia has once been acquired, its increase is directly caused by the pressure on the globe by the extrinsic muscles, due to the convergence of the visual lines toward the far point—the convergence theory.

5. The weight of evidence and reason is distinctly against the accommodative theory.

6. Theoretically, full correction of the myopia is indicated, whereby the far point is thrust to infinity.

7. Practically, this is not always possible.

8. The far point should be thrust as far as possible toward infinity, but, at the same time, it should be compatible with the best vision and the greatest comfort."

The Development of the Fusion Center in the Treatment of Strabismus.

BLACK, NELSON MILES, Milwaukee. (*Jour. Amer. Med. Assn.*, Oct. 10, 1903.) The author continues with this paper the discussion of the non-operative treatment of Strabismus more especially the development of the fusion center, the cure of the amblyopia and developing the use of the non-fixing eye.

"Man being a binocular animal must, in his normal condition, receive two sets of sensations from any luminous object: these transmitted to the visual areas of the brain; from there they must, in the normal state, be transmitted to a coordinating center, or, as I shall call it, the fusion center, where they are blended; here binocular vision becomes binocular single vision. In order to allow of a blending or a fusion of these two sets of sensations, identically corresponding portions of the retinæ of the two eyes must be influenced by the pencil of light; this requires binocular fixation.

To perform the normal function of seeing, then, we must have:

1. A normal perceptive apparatus, i. e., emmetropic eyes.
2. Perfectly balanced extrinsic muscles.
3. Normal transmitting apparatus.
4. Perfect receptive apparatus, and, finally,
5. A fully developed fusion center.

From this center must emanate all the efferent impulses to the various subsidiary centers for all changes in the accommodation, direction of the visual axes and positions of the head and body that are required to bring corresponding retinal points into focus; hence, when the development of this center, or its function after development, is any way disturbed or interfered with we have as a result those deviations of the visual axes known as heterophoria and heterotropia, or strabismus; not due to abnormalities in the anatomic relations of the orbit and muscles and paralyses of the same.

The following conditions interfere with the development of the fusion center:

1. Refractive errors.
2. Inequality in the sight of the two eyes.
3. Faulty perceptive, transmitting or receptive apparatus.



Worth-Black amblyoscope, having vertical movement.

4. Abnormal relations between orbit and muscles, their over or under-development and paralysis of one or more of them.

Because the sensation sent by the eye to the fusion center can not compete in distinctness with that sent by the fellow

eye, in anisometropia (even if slight), congenital amblyopia, opacities of the media or faulty conductive and receptive apparatus of one eye, it is disregarded, the center develops without its influence and the eye, receiving no return impulse, has no point to fix, and, consequently, the visual axes deviate; if, however, the center has been developed before these factors appear, habit usually holds the visual axes straight afterward."



Worth-Black deviometer for determining degree of deviation in squint.

The author has followed the work of Worth (London) during the last year with much success. They advise development of the fusion center in all young children—before operative means are tried for correction of the muscular deviation. For this they use a special form of stereoscope called the amblyoscope with special, simply made, picture slides to which the child's attention is readily held.

The author has improved the Worth model by an addi-

tional vertical movement in order to obtain fusion when the lateral deviation is complicated by vertical deviation. (The method of using the instrument is fully described in Worth's book "Squint," and in the article by Black, "A plea for the early treatment of squint," May 24, 1902, *Journ. Amer. Med. Assoc.*) He also has devised with Worth, a deviometer for measuring squint both of which instruments are here figured.

Some cases, however, will undoubtedly require operation to bring about complete parallelism of the visual axes; but, if the desire for fusion has been established—and Worth assert it can be acquireed in early childhood—it is only neccessary to bring the visual axes approximately straight, because a desire for fusion, which has been acquired by the use of the amblyoscope, will then place and hold the eyes in such position that identically corresponding portions of the two retinae are affected.

BOOK NOTICES.

Text Book of Diseases of the Eye, for Students and Practitioners of Medicine.

HANSELL, HOWARD F., A. M., M. D., and SWEET, WILLIAM M., M. D. With chapters by Christian R. Holmes, M. D., Casey A. Wood, M. D., D. C. L., Wendell Reber, M. D. With 256 illustrations, including colored plates. P. Blakiston's Son & Co., Philadelphia. Price, \$4.00.

It has given me distinct pleasure to read and review this most deserving text book. Despite the fact that the market is flooded with works occupying the same field, this book is to be welcomed by ophthalmic students and practitioners. The subject matter is presented tersely, practically and comprehensively; purely scientific and theoretic subdivisions being briefly treated, while the common affections and traumatisms are emphasized. There are more than the usual number of original illustrations in this work, prepared from hospital and private cases, and those that have been selected from other works are of artistic as well as medical value; the original illustrations dealing with operations are particularly good; those diseases, especially the fundus pictures, are well done; the only positive poor one seems to be Fig. 129, which certainly is not a representation of "Hutchinson's teeth," but rather the teeth of delayed dentition, *i. e.*, the scrofulous variety.

We would like to see dosage of remedies given in the metric system, or, at least, the equivalents of the ancient apothecaries system, according to modern usage and the recommendation of the American Medical Association and other scientific societies.

The appendix contains carefully compiled essays upon color perception and blindness; method of localizing foreign bodies in the eye or orbit by the Röntgen rays; economic value of vision, etc., which are thoroughly up to date and of prime interest to special students. The author's descriptions are clear, and the treatment clearly up to date. The book is beautifully printed and bound, and is commended, not only

to students, but also to the well versed ophthalmic practitioner.

H. V. WÜRDEMANN.

The eye must be a popular study, or else practitioners are more attacked by the itch of authorship because it is a difficult matter to keep trace of the host of new text books on the fascinating subject. The Philadelphia school seems unusually active and has luxuriated of late in blossom after blossom from their ophthalmic cultural garden:—the last is this book before me. What fate it will meet I dare not say, but it deserves popularity, and I hope it may achieve it. The illustrations are the charm of the book and will be helpful to any one who uses it, especially those dealing with operations, for they are singularly life-like. Naturally, in a book by Sweet, one expects to find a detailed technic for locating foreign bodies in the eyeball, and the appendix (p. 502) supplies us with his method, clearly and forcibly. The authors have endeavored to make the book both American (as it is, I am proud to say), dealing with heterophorias and other muscle anomalies—as well as modern, for they suggest Worth's amblyoscope, Mules' operation, the cataract mask and many such improvements. There are plates illustrating the microorganisms and suggestions as to the economic value of vision.

I hope others will be impressed with the beauty and value of this book by Hansell and Sweet.

A. B. HALE.

Atlas of the External Diseases of the Eye.—Saunders' Medical Hand-Atlases.

HAAB, PROF. DR. O. of Zurich. Second Edition, Thoroughly Revised. Edited, with additions, by G. E. De Schweinitz, A. M., M. D., Professor of Ophthalmology in the University of Pennsylvania. With 98 colored lithographic illustrations, on 48 plates, and 232 pages of text. Philadelphia, New York, London: W. B. Saunders & Company, 1903. Price, \$3.00 net.

This Atlas on External Diseases of the Eye forms an excellent companion-book to Professor Haab's "Atlas of Ophthalmoscopy and Ophthalmoscopic Diagnosis," and is just

what might be expected from an author of such broad clinical experience and trained observation. Starting with examination of the eye the student is easily and gradually led from one examination to another, thus becoming familiar with the best methods of investigating the eye for the detection of disease. In the chapters on diseases of the eye which follow, the most important diseases are clearly described and the best therapeutic measures recorded. The text has been amply illustrated by a series of beautiful chromo-lithographic plates, to each one of which a clinical history is appended. This second edition has been thoroughly revised and brought down to date, and a number of new chromo-lithographic plates added. As in the first edition valuable editorial comments are introduced, and reference made to many of the modern therapeutic agents.

The reviewer has commended these medical hand-atlases on many occasions, both orally and in print, more especially the atlases of Haab. The very moderate price for which the books are sold commends them to the medical student and the young practitioner, as well as to the ophthalmologist. The colored plates are true to nature, and the accompanying print makes the work a text book as well as atlas. The text has been brought up to date, not only by Haab but also by Schweinitz. Not only the student but the active practitioner can hardly afford to be without the book.

H. V. WÜRDEMANN.

Atlas of Ophthalmoscopy. Lehmann's Medical Hand-Atlases, Vol. VII.

HAAB, PROF. DR. O., Zurich. Fourth Edition. Price, 10 Marks (\$2.50).

Atlas und Grundriss der gesammten Augenheilkunde, Band II: Ophthalmoskopie und Ophthalmoskopische Diagnostik, mit 149 farbigen und 7 schwarzen Abbildungen, von Prof. Dr. O. Haab in Zurich. Vierte verbesserte Auflage. München, 1903. J. F. Lehmann's Verlag.)

This is the original or German edition, published by J. F. Lehmann of Munich, translations of which now appearing in America, under the auspices of W. B. Saunders & Company, Philadelphia, and we may shortly expect to see the American edition of the same work. The book is greatly enlarged, the original edition having 64 pages of text and 102 colored

pictures of the fundus. This fourth addition has 92 text pages, 149 colored and 7 black and white illustrations.

While in Zurich recently, the reviewer had the opportunity to spend several days with Prof. Haab and to put in some hours with him learning the technic of his method of making ophthalmoscopic pictures. A very large proportion of these in his book are drawn by him with marvellous accuracy as to detail and color, and have been well reproduced by Reichhold in Munich. Lithographic reproduction in color is one thing in which the German's excel, both as to quality and to cheapness of production. The *Annals* has at times published pictures in color, some from my own drawings, but as yet we have been unable to obtain such good results as is done in Germany. The cost of reproduction of a single colored picture for the *Annals* has been quite high. It is a marvel to us how the edition of this very complete Atlas could be brought out for the very moderate price for which it is sold. This, as well as the previous edition, is most highly recommended to all those who are at all interested in ophthalmoscopy.

H. V. WURDEMANN.

Text Book of Ophthalmology.

MAY, DR. CHARLES H. (Grundriss der Augenheilkunde, von Dr. Charles H. May, Chef der Augenklinik, med Abteilung, Columbia Universität, New York. Autorisierte deutsche Ausgabe für deutsche Studierende und Aerzte bearbeitet von DR. E. H. OPPENHEIMER, Augenarzt in Berlin. Mit 13 Farbendrucktafeln (36 Figuren) und 191 Textabbildungen. Berlin, 1903. Verlag von August Hirschwald, NW. Unter den Linden 68.)

This is the German edition of Dr. May's text book which has already passed through four American editions, and now appears under the auspices of Dr. Oppenheimer of Berlin. This is one of the few American works that has been translated into the German language—a great compliment for Dr. May. The contents are much the same as those of the American edition reviewed in the October, 1903, *ANNALS*. It is, however, better printed, and there are a number of new illustrations. As is customary with the German school, much more attention, comparatively speaking, is given to paralysis of the ocular muscles, a condition which is much less

frequent, than to heterophoria and strabismus. The arrangement of the book is particularly adapted for the use of undergraduate students and the general practitioner.

H. V. WÜRDEMANN.

The Ocular Circulation.

PARSONS, J. HERBERT, B. S., B. Sc., F. R. C. S., London:
John Bale, Sons and Danielsson, Ltd, 190c. Pp. 76. Price 3 shillings.

The author has published these lectures in the hope that a fuller account than is usually found in the ordinary textbooks may prove useful.

The first section treats of the anatomy of the ocular circulation; previous to describing that existing in man, the condition found in the rabbit and the dog is given. "The general tendency as we ascend the animal scale is for the principal ophthalmic artery, which in the lower members is derived from the external carotid, to be derived from the internal carotid. On the border line there are usually two or more ophthalmic arteries—generally one derived from each source, and there is commonly an anastomotic branch linking the two systems." The intraocular vessels are fully described, both as found in man and as existing in the lower animals, and their anomalies are pointed out.

The second section is a study of the physiology. "The ophthalmic artery, from which the whole of the blood supply of the eye is derived in man, is a branch of the internal carotid within the cranium. It is therefore a different offshoot from the intracranial circulation, and much stress has been laid upon this fact clinically, so that the condition of the retinal arteries has been assumed to be a criterion of the circulation within the skull. More minute investigation of this question, however, educes many facts which so seriously modify such an assumption, that it can only be accepted with severe limitation." The subjects of pressure within the ophthalmic artery and intraocular pressure are taken up, and the results of experiments bearing upon the influence of the cervical sympathetic, the trigeminal, changes in the blood supply of the eye, and changes in the general blood pressure (from mechanical causes, stimulation, drugs, asphyxiation, ligature of the venae verticosae, and death) are given.

The third section takes up the relations of the intraocular

to the intracranial circulation. The main results adduced from experiments in this direction are: "That local pressure applied for a short time to the parietal region is without effect upon the intraocular circulation, but that fluid pressure is more equally distributed and may have a very definite influence. It seems clear that, at any rate in the dog, the arteries at the base of the skull are very well protected from pressure, especially the transmission of pressure applied at a distance; and that any effect upon the venous sinuses is counteracted by the free anastomosis of the ocular veins with those of the general circulation." While not advancing an original theory of the production of optic neuritis, the author hints at the possibility of a new explanation in which edema is a prominent factor.

The fourth and final section is devoted to some physiological and pathological anomalies of the ocular circulation, including arterial pulsation, capillary pulsation, venous pulsation, embolism of the retinal arteries, section of the central retinal vessels, glaucoma, and toxic amblyopias. Regarding the last affection, the author alludes to his previously expressed views that tobacco amblyopia is the result of two chief factors: (1), a toxic effect upon the nerve cells, leading to paralysis of some of the retinal elements, (2), and a vascular effect, causing vaso-constriction of the retinal arterioles; his experimental results, he admits, showed that it was not possible to be as certain of the vascular effect as he had imagined. He considers it probable that tobacco amblyopia is essentially a neuroparalytic condition, with slight active vaso-constriction as a subsidiary factor; while quinine amblyopia is essentially a vascular condition, with marked passive vaso-constriction.

Altogether, this essay of 76 pages, with an abundance of illustrations, is extremely interesting and instructive, and will well repay perusal.

CHAS. H. MAY.

The American Illustrated Medical Dictionary. For Practitioners and Students of Medicine.

DORLAND, W. A. NEWMAN, A. M., M. D., Asst. Obstetrician to the University of Pennsylvania Hospital, Fellow of the American Academy of Medicine, Editor of the "American Pocket Medical Dictionary," etc., etc. Third Edition, revised and enlarged; handsome, large octavo, nearly 800 pages, bound in full flexible leather. Philadelphia, New

[York, London; W. B. Saunders & Co., 1903. Price, \$4.50, net; with thumb index, \$5.00, net.

A complete dictionary of the terms used in medicine, surgery, dentistry, pharmacy, chemistry and all kindred branches, including much collateral information of an encyclopedic character, together with new and elaborate tables of arteries, muscles, nerves, veins, etc.; of bacteriology in full; eponymic tables of diseases, operations, signs and symptoms, stains, tests, methods of treatment, etc., etc.

The author, in this neat volume, has combined the advantages of the large medical lexicon and the abridged student's dictionary, eliminating all their disadvantages. It is a convenient word book, containing in addition such encyclopedic knowledge as is of value to the medical man, presenting all in such full, yet concise form, that it becomes a pleasure to consult it. By careful and constant revision the author has kept pace with the progress of medical science, and in this volume presents to the profession a work of much value.

M. A. G.

This dictionary is a standard, this being the third addition, greatly enlarged and revised. It is a most convenient medical dictionary, containing as it does, practically, all the words used in professional speech or writing. The spelling is American, and is standard. Definitions are contracted to allow of rapid reference and are yet sufficient to give synonyms and descriptions. There are a number of illustrations in black and white, and colors; also new and elaborate tables. It is of great use to those engaged in all branches of medicine.

H. V. WÜRDEMANN.

The American Pocket Medical Dictionary. Especially Recommended for Students and the Busy Practitioner.

DORLAND, W. A. NEWMAN, A. M. M. D., Ass. Obstetrician to the Hospital of the University of Pennsylvania. Containing the pronunciation and definition of the principal words used in medicine and the kindred sciences; with 566 pages and 64 extensive tables. Philadelphia, New York London: W. B. Saunders & Company, 1903. Flexible, leather, with gold edges, \$1.00, net; with thumb index, \$1.25, net.

In this little work, now in its fourth edition, we have a pocket dictionary equaled by none. Several thousand of the newest terms that have appeared in recent medical literature have been added, and the entire work carefully revised.

Since the work has come to us for review, we have had many occasions to refer to it for definitions of new words, and in no instance have we been disappointed. We believe that the work in its new form will meet more fully than ever, a real demand on the part of physician and student.

M. A. G.

This pocket dictionary has now reached a fourth edition, and has been somewhat enlarged and carefully revised. It contains nearly all the medical words, with brief definitions, and is a most useful hand book for students and physicians.

H. V. WÜRDEMANN.

Lessons on the Eye. For the Use of Undergraduate Students.

HENDERSON, FRANK L., M. D., Ophthalmic surgeon to St. Mary's Infirmary, and the Christian Orphans' Home; consulting oculist to the St. Louis City Hospital, etc. Third edition. Philadelphia. P. Blakiston's Son & Co. (Price \$1.50.)

For a quiz course on the eye to undergraduates, the reviewer thinks this is the best little book to date, and thus uses it for his own classes. It contains the principles of anatomy, physiology, and diseases of the eye that must be known by the undergraduate student; it is not a condensation of the entire science of ophthalmology, but a little work characterized by a prominent representation of the most important subjects and elision of those which belong to postgraduate study and to the specialist.

The subject is divided into 28 lessons, or 1 lesson for each week of a seven months session. The third edition, following within a year, bespeaks the popularity of the book among teachers and medical students. The only criticism the reviewer can make is, that some additional matter has been added, whereas for the purpose of the book, even a little pruning here and there might be made.

H. V. WÜRDEMANN.

Physician's Visiting List.

P. BLAKISTON'S SON & CO.'S VISITING LIST FOR 1904 has again appeared ready for the new year. It deserves the highest praise as a practical aid to physicians' accounts and as carrying much information needed by him in the day's routine. Such a book is better than a simple day book.

A. B. HALE.

The Functional Examination of the Eye and Its Utilization For General Diagnosis.

SCHWARZ, O., PROF., Leipzig. Die Functionprüfung des Auges und ihre Verwertung für die allgemeine Diagnostik. Für Aerzte und Studierende. Three hundred and twenty-two p., with 81 figures in the text and one plate. Berlin, 1904. S. Karger. M. 7. \$1.75.

The aim of this book is to treat the functional examinations in connection with the functional disturbances and their immediate causes and to demonstrate how the results, combined with other findings, may be utilized for diagnosis. Thus it deviates entirely from the systematic text books of ophthalmology, and, by discussing the functional examinations in a very complete manner, it serves as a most valuable supplement and introduction to the former. The first part contains an epitome on the optics of the eye: dioptrics, with special and more exhaustive consideration of astigmatic refraction, the optic conditions of vision, and spectacles. In the second part the acuity of perception is considered in numerous subdivisions, first the sense of space, static refraction, accommodation, its dependence on convergence, etc., light sense and color sense, visual field, mindblindness, then in a very elaborate manner, the physiology and pathology of the pupillary movements, finally the ocular motility and its disturbances, with an appendix on simulation. The third part is devoted to the diagnostic application of the functional disturbances: acquired changes of refraction, diminution of central vision, disturbances of light and color sense, of visual field, pupils, accommodation and motility. As by the arrangement of the subject matter we here find many things collected, for which we might look in vain in the text books, it is a most useful work which has our full approval.

C. ZIMMERMANN.

Diseases of the Eye in Relation to Affections of the Nose, Accessory Cavities and the Ear.

EVERSBUSCH, OSCAR, PROF., München. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde, 2d, entirely new, edition. Nos. 61 and 62, with 20 illustrations. Leipzig, 1903. W. Engelmann. Subscription price, M. 4. \$1.00.

Aside from the fact that the naso-lacrimal duct opens into the lower nasal meatus and the sensitive nerves of the mucous membranes of the eye and nose partly have a common origin, a most intimate relation between both organs exists through the accessory cavities of the nose, bordering above, inward and below on the orbit. Thus an anatomical predisposition is given to the propagation of pathological processes from the nose to the eye, and it is of great value that a special chapter of the new edition of the great handbook is allotted to the elucidation of these relations. After an anatomical review, illustrated by very good drawings, the congenital defects of the separating walls and the affections of the nose and sinus are discussed, which may be propagated mechanically or by conveyance of infectious matter, or may set up functional disturbances of the eye. Quite a number of cases are described as paradigmata. Eversbusch ascribes, with others, the functional disturbances partly to an intoxication from absorption of purulent or fetid material, partly to reflex actions. He also repeatedly observed intense swelling of the nasal mucous membrane, at first on the corresponding side, preceding the outbreak of sympathetic ophthalmia in the second eye, and that more or less marked catarrhal symptoms of the nose accompanied exacerbation of sympathetic iridocyclitis. In some of these cases a beneficial effect was noticed from nose bleeding. The importance of affections of the teeth as the only guide to diagnosis of some ocular troubles (rachitis, syphilis, tuberculosis, actinomycosis, lymphadenitis, asthenopia, neuralgia, increased tension, zonular cataract, reflex irritation), and the influence of diseases of the nasopharynx, tonsils, parotis and their sequellae on the eye are minutely set forth.

In the chapter on the relation of diseases of the ear to those of the eye the general causes, common to both, as syphilis, tumors within the cranial cavity, injuries, etc., the

affections of the 5th and 7th nerves, influencing both, are discussed. The greatest portion is devoted to the disturbances of the visual organs, due to otitic diseases of the brain, meninges and sinus, with thorough utilization of the recent literature, and a completeness as it will not be found anywhere else.

C. ZIMMERMANN.

Methods of Examination.

LANDOLT, EDMUND, DR., Paris. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde, 2nd edition, entirely rewritten. Nos. 59 and 60, pages 145 to 304, with 68 figures in the text. Leipzig, 1903. W. Engelmann. M. 4. \$1.00.

On page 573 of the ANNALS, Vol. XII, we reviewed the first part of Landolt's work. The present Nos. commence with a chapter on Keratoscope and Keratometry by Dr. A. Eugen Fick, who gives a detailed explanation of the ophthalmometer of Javal and Schiötz, while the others of Mandelstamm and Schöhr, Landolt, Reid, Leroy and Dubois are more briefly described, and finally sums up the results of keratometry. The next chapter on dioptry, the measuring of the refraction of the eye is again by Dr. Landolt. After an optical introduction the subjective methods of ascertaining refraction are discussed, with trial lenses, and the different kinds of optometers, with one convex lens, according to the principle of the terrestrial and astronomic telescopes, by measuring the circles of diffusion with the aid of chromatic aberration of the eye and the objective methods by the direct and indirect images and sciascopy which is very exhaustively treated. The historical remarks of L. on sciascopy are very interesting as they reveal that the first explanation of it was not given by the inventor, but by Landolt. After a paragraph on the estimation of the influence of the lens on the refraction of the eye the author gives some very good experimental instructions for the better understanding of astigmatism with illustrations. Finally the methods of determining the degree of astigmatism subjectively and objectively are presented. The book proves a reliable and valuable guide in all parts of this intricate, but important field of ophthalmology.

C. ZIMMERMANN.

Circulation and Nutrition of the Eye.

LEBER, TH., PROF., Heidelberg. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde, 2nd edition, entirely rewritten. Nos. 57 and 58. Leipzig, W. Engelmann. 1903. M. 4. \$1.00.

The first part of this fundamental work of Leber we reviewed in the ANNALS of October, 1903. In the present Nos., which conclude the book, the author discusses the ways of nutrition of the cornea. The assumption of the existence of lymphatic spaces between the corpuscles of the cornea and its fibrillar substance is not in the least warranted by the fact that these spaces can be injected. It can be only inferred that their connection is very loose, so that they can be easily separated by the penetrating fluid. Absorption of dissolved or colloid substances from the anterior or posterior surfaces of the cornea takes place by diffusion through the intercellular spaces of the epithelium and endothelium through Descemet's membrane and the corneal substance proper. Thus the metabolism of the cornea is affected exclusively by filtration from the marginal bloodvessels and by diffusion, partly perhaps also through the aqueous. Serious disturbances of nutrition of the cornea follow the interruption of the circulation of the chorioid, apparently from secondary alteration of the circulation in the ciliary body, while opacities of the cornea, caused by certain poisons (inhalation of chloride of ethylene, in cachexia strumipriva) consist in necrosis of the endothelium. Nineteen pages are devoted to the influence of the 5th and sympathetic nerves upon the cornea and the neuroparalytic affections of the cornea. The latter is due to insufficient moistening of the cornea from the lacking lacrimal secretion, not to trophic influences. F. Krause's observations after resection of the ganglion Gasserianum are duly considered.

The next section deals with the nutrition of the lens, which must be attributed to the ciliary body. Artificial ripening of cataract by massage is brought about by destruction of the epithelium of the lens and the subsequent access of the aqueous to the lens substance. Some observations on diabetic cataract seem to favor the view that the latter is due to autointoxication of the lens, analogous to the action of protoplasmic poisons (naphthalene). Exposure to high tem-

peratures may lead to opacities from concentration of the aqueous by intense perspiration, while the action of lightning produces a primary necrosis of the epithelial cells and lens fibres with subsequent opacities. Interruption of the circulation of the chorioid causes necrosis of the epithelium and opacities of the lens very likely from the arrested supply of oxygen.

In the chapter on the circulation and nutrition of the conjunctiva the resorption of metallic solutions and of fine powders (calomel, india ink, cinnabar) by the intact conjunctiva is described. But neither a local or general infection by pathogenic microorganisms occurs through the intact conjunctiva, if the lacrimal duct is closed. Then the influence of the 5th and sympathetic nerves, and of drugs upon the conjunctiva and the secretion of the conjunctiva are discussed. The last section is devoted to the circulation of the orbit and its connection with that of the cranial cavity, viz: the flow of the cerebrospinal fluid through the intervaginal space to the optic nerve, the influence of intracranial pressure on the intraocular end of the nerve and the transport of pathological products and microorganisms along the optic path.

Although the literature is extensively quoted, (the bibliography alone embraces 43 pages), we recognize on almost every page the author's own investigations, enabling him like few to a critical utilization of the former. In this originality and thorough familiarity of the author with the subject lies the high value of this remarkably good book, which is written in such an attractive form that it is a pleasure to read it.

C. ZIMMERMANN.

Pictures for Stereoscopic Exercises.

DAHLFELD, C. DR., Riga. Bilder für stereoscopische Uebungen zum Gebrauch für Schielende. 28 plates, with explanatory text. 4th edition. Stuttgart, Ferdinand Enke, 1903. M. 4. \$1.00.

In Vol. X of the ANNALS we reviewed the 3rd edition of these pictures and emphasized their characteristic features. That after three years a new edition of them became necessary speaks for their usefulness. They are very neatly and carefully executed and we take great pleasure in recommending the new edition.

C. ZIMMERMANN.

Transactions of the Thirtieth Congress of the German Ophthalmologic Society, Heidelberg, Nineteen Hundred and Two.

Edited by TH. LEBER and A. WAGEMANN. 388 pages with 18 plates and 13 figures in the text. Wiesbaden, J. F. Bergmann, 1903. 9.60 M. \$2.40.

P. ROEMER, Würzburg: *Further investigations on the serum therapy of serpent corneal ulcer.*

According to statistics, obtained with the cooperation of the Government, in Bavaria, R. shows the frequency and social importance of serpent ulcer which urgently requires relief. His recent bacteriological examinations of 80 cases revealed in 95 per cent. pneumococci in pure cultures, no mixed infections. Thus the serpent ulcer in man is due to a specific infection by pneumococci like pneumonia. The manufacture of his serum has not yet attained the desired stage of perfection, but in some recent cases of his it prevented the development of serpent ulcer and healed some other cases in which the ulcer had developed four to seven days previously.

In the discussion Axenfield advocates the extirpation of the tear sac as prophylactic.

E. RAEHLMANN, München: *On Trachomatous affections of the tarsus and borders of the lids.*

R. shows the frequency of the affections of the borders of lids and tarsus in trachoma by statistics on 657 trachomatous eyes. The follicular accumulations of round cells are chiefly found at the places of perforation of the tarsus by the conjunctival vessels, around the latter and at the ciliary margin around the glands, especially those of Moll, the sebaceous, the roots of the cilia and their follicles. These affections are, of course, of great importance with regard to the course of the disease.

L. BACH, Marburg: *On the Pupillary Centers.*

B.'s experiments on cats led to the assumption of a regulating influence of the spinal end of the fossa rhomboidae on the pupillary reflex as a checking center.

A. PETERS, Rostock: *Alterations of the Ciliary Epithelia in Intoxications by Naphthaline and Ergotinine.*

P. found in rabbits simultaneously with the well known formation of horizontal stripes on the lens capsule, 24 hours after giving naphthaline, changes of the ciliary and pigment epithelia, due to increased secretion, and alteration of the aqueous which he considers as the cause of the development of cataract. The same results were obtained by ligating the vorticosae veins and by feeding ergotinine. In ergotinine intoxication however no formation of cataract was observed, since all animals died after a few days, but P. thinks that it will be possible to prove it.

A. VOSSIUS, Giessen: *Goitre and Cataract.*

V. observed 14 cases of cataract in women, affected with goitre and attributes the cause to the suppressed secretion of the thyroid gland from the following reasons: 1. The form and hard consistence of the cataract. 2. The occurrence in young persons. 3. The analogy with cataract in tetany, observed by Peters.

In the discussion E. Pflüger, who practices in Bern, an exquisite goitre region, stated that his material of cataracts is not uncommonly large and that he never found such a connection in any of the patients who had been operated on for goitre by Prof. Kocher.

A. ELSCHNIG, Wien: *On Histological Artefacts in the Optic Nerve.*

E. demonstrated experimentally that the peculiar patches of the optic nerve, described by A. Siegrist at the previous meeting (see ANNALS 1902, p. 609) are nothing but mechanical insults, inflicted in enucleations or in opening the optic canal in postmortem examinations.

E. VON HIPPEL, Heidelberg: *Embryologic Investigations on the Mode of Development of Congenital Typical Colobomata of the Eye.*

v. H. examined in serial sections 112 ocular vesicles of embryos and new born animals, raised from a mail rabbit with

coloboma of the optic disc, 23 of these showed colobomata. The positive results were that heredity was the only etiological factor and that the coloboma was due to an arrest of development; the mechanical prevention of closure of the fetal fissure was the primary disturbance, the incomplete formation of chorioid and sclera a secondary occurrence.

A. WAGENMANN, Jena: Advocates as a local anesthetic in operations on the lids chloride of ethyl, applied by a spray apparatus devised by himself.

E. PFLUEGER, Bern: *The General Narcosis, Practiced at the Eye Clinic of Bern.*

Inhalation of chloroform vapors with the employment of a respiration apparatus, devised by H. Kronecker, proved to be very effectual and safe, on account of the possibility of their gradation.

E. FUCHS, Wien: *Scleritis Posterior.*

F. reports a case in which the eye was very painful, the conjunctiva at the lateral angle injected and the episcleral tissue swollen and sensitive to pressure. The retina over the scleritic focus was bulged forward 3 to 4 D. and opaque from inflammatory edema. All disappeared completely.

W. STACK, Freiburg: *Experimental Contributions to the Localizations of Endogenous Affections in the Eye and to the Origin of Iritis and Chorioiditis.*

Injections, of toxines of diphtheria, staphylococcus aureus and bacterium coli into the posterior portion of the vitreous yielded absolutely negative results. Injections of cultures of pyocyaneus were followed by metastases in the eyes. In most cases the iris alone was affected, showing nodular iritis. If one eye was irritated it had a greater disposition to metastasis than the other in slight infections, in more severe infections the irritation did not seem to have any influence. The inflammatory and degenerative symptoms on the eye differ considerably if the infection takes places through circulation or directly by injections into the anterior chamber or vitreous.

W. VOLKMANN, Berlin: *The Theory of Eye Magnets Applied to Practice.*

Two classes of eye magnets must be distinguished, serving either for traction or for carrying weight. For the former only the shape (i. e., the proportion of width to length) of the pieces to be extracted is essential, not the weight. For testing them, bicycle ball bearings of steel are used. Always the smallest possible force of traction is to be employed. The power of the weight-carrying magnet increases at inverted ratio with the size of the piece to be extracted. Therefore much thinner probes, than heretofore used, are to be recommended. The traction magnet is preferable in fresh wounds with loose pieces of iron, but not when the latter are tightly imbedded, since the velocity, imparted to them after liberation, would be too great and might become deleterious for the eye.

E. FRANKE, Hamburg; *Diagnosis and Treatment of Retrobulbar Affections.*

F. demonstrates the usefulness of the examination with Roentgen rays for the diagnosis of foreign bodies and sometimes tumors of the orbit.

E. KRUCKMANN, Leipzig: *On Syphilitic Iridocyclitis.*

The syphilitic affections of the eye chiefly consists in diseases of bloodvessels and cellular infiltration, and the single ocular syphilides differ only in degree. Only gummata extend beyond the borders of the vascular system. Some excellent colored figures illustrate the conditions.

TH. AXENFELD, Freiburg: *On Intrasccleral Nerve Loops of the Ciliary Nerves.*

O. SCHIRMER, Griefswald: *On Lacrimal Secretion and Excretion after Exterpation of the Sac.* Most patients complain of epiphora only when exposed to wind. If two weeks after the operation, disagreeable weeping still exists indoors, it is due to conjunctivitis or ectropium and requires astringents. In very obstinate cases extirpation of the lacrimal gland gives relief.

H. WOLFF: *On the Theory of Sciascopy, etc.* See our review of the author's monograph of the same title, ANNALS OF OPHTHAL., 1903, p. 210.

A. GULLSTRAND, Upsala: *Remarks on the Color of the*

Macula. G. found in 6 eyes, immediately after enucleation, under water, the macula colorless and attributes the yellow appearance of it to postmortem conditions.

Schmidt-Rimpler and Sattler who, however, did not examine under water, state that they observed distinctly the yellow color of the macula in fresh retinae, and Leber quotes an observation of Kuhne to the same effect.

R. GREEF, Berlin: *On an External Fovea in the Human Retina.* G. infers, from the reduced length of the cones, also an external fovea toward the chorioid at the region of the internal fovea of the retina.

A. BIELSCHOWSKY, Liepzig: *The Innervation of the Internal Recti Muscles as Adductors.*

B. reports a case in which the interni alone lost their ability to move to the sides.

LIEBRECHT, Hamburg: *On Anatomico-pathological Changes of the Optic Nerves in Cerebral Tumor and the Pathogeny of Choked Disc.*

Choked disc is chiefly due to stagnation of lymph in the optic nerve and the disc, with or without inflammation. The primary affections is the edema.

F. BEST, Giessen: *On Congenital Chorioretinitis.*

Best, observed in nine children pigment changes of the fundi which appeared like soot, dusted on, with numerous minute light spots between, similar to the description of Haab and Sidler—Huguenin who considers these affections as characteristic of hereditary lues. There being no symptoms or histories of hereditary lues, and occurring among a population relatively free from syphilis. Best does not consider them due to hereditary lues.

W. UHTHOFF, Breslau: *On Visual Disturbances After Injuries of the Brain and Functional Nervous Alterations in Anatomical Lesions of the Brain.*

Uhthoff, reports a case of abscess of the left occipital lobe after an injury with right homonymous hemianopia, visual hallucinations, hemianesthesia of skin and other senses on that side. The latter was not constant, but could be vol-

untarily produced by compression of the injured region. The anatomical conditions, found at the autopsy, are described.

A. VOSSIUS, Giessen: *Two Rare Cases of Orbital Affections*. A wound of the temporal portion of the ocular conjunctiva by a nail, became infected by streptococci and led to thrombophlebitis of the orbital veins with suppuration, exophthalmus, absolute immobility and anesthesia of the globe, gangrene of the lids and sloughing of conjunctiva, cornea and a portion of the sclera. The second was a case of actinomycosis of the orbit, in a shepherd, starting behind the wisdom tooth of the left upper jaw and finally invading the brain through the petrous bone.

TH. BAENZIGER and W. SILBERSCHMIDT, Zürich: *On the Etiology of Panophthalmitis After Injuries by Chips of Harrows*.

Chips of harrows in the vitreous, even after successful magnet extraction, are apt to rapidly cause panophthalmitis. Bacteriological and experimental investigations of the authors showed that panophthalmitis in these cases is due to a bacillus, belonging to the group of hay bacilli, which is found in the soil of that part of Switzerland around Zürich in which these injuries are very frequent.

HUGO WOLFF, Berlin. *On Bilateral Pathologic Light Reflex of the Macula (retinitis serosa centralis), a New Diagnostic Symptom of Bright's Disease*.

On bilateral central serous retinitis in diabetes, lues, pregnancy, peripheral and central myopic serous retinitis and monolateral traumatic chorio-retinitis, observed with Wolff's ophthalmoscope.

G. GUTMANN, Berlin: *Experiences with Angelucci's Modifications of Simple Cataract Extraction and Their Application to Other Operations*.

Angelucci's method consists in fixating the globe by grasping the tendon of the superior rectus, without inserting a speculum, which insures much greater immobility and facilitates not only cataract extractions but all kinds of operations on the eyeball.

C. HAMBURGER; *On the origin of the aqueous humor.*

The bulk of the aqueous humor is secreted from the anterior surface of the iris, not from the ciliary body. Under physiological conditions the pupil is not permeable for intraocular fluids, but is shut off like through a valve.

AUGSTEIN, BROMBERG: *On visual circulation in newly formed corneal bloodvessels and its significance.*

In the two following sessions histological preparations, new apparatus and instruments were demonstrated, the descriptions of which must be read in the original.

We highly recommend the study of this valuable volume which contains the discussions of the most important questions of the day by competent authors. Like the preceding volumes it is very handsomely gotten up and has excellent plates.

C. ZIMMERMANN.

A Study of the Medico-Legal Aspect of Traumatism of the Eye and its Adnexia.

BAUDRY, S., Professeur de Clinique Ophtalmologique à l'Université de Lille. Troisième Edition. Revue et augmentée. Paris, Vigot Frères, 1904, small octavo, p. 323.

Careful study of this, the latest edition of Professor Baudry's most valuable work, shows not only a thorough revision of the entire original subject matter, but the insertion of much material that is valuable and new.

Hysterotraumatism and feigned affections of the ocular apparatus are given more in detail and treated of in the light of the latest authoritative teachings. The laws of insurance, the grades of the working values of injured visual organs and the relationships of travel and ocular accidents are all presented in accordance with the most recent legal decisions. The legislative portions of the work have been revised to date.

The reader of these few lines of review of this most excellent work, is recommended to make an earnest and most extended perusal of Professor Baudry's book, which will reward him by much knowledge upon the subject which is new and useful.

C. A. OLIVER.

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No. 2.

A STATEMENT OF OUR PRESENT KNOWLEDGE OF THE ARCHITECTURE OF THE CEREBRAL VISUAL APPARATUS, IN THE LIGHT OF THE NEURON THEORY, AND THE LATER CLINICO-PATHOLOGIC INVESTIGATIONS.

BY W. E. GAMBLE, M. D.,

CHICAGO.

The great amount of labor required to collate the findings of the experimenters on the brain of the monkey and the researches of the clinico-pathologists, has led me to publish the results of my labor, hoping thereby to save others to a more or less extent, this drudgery.

The neurone theory has greatly simplified our conception of the histology of the retina, and the cerebral visual apparatus. We no longer think of the retina as being composed of layers, ten deep, the pigmentary, the outermost; the membrana limitans interna the innermost: while the remaining eight layers, meaningless and unintelligible, lie between.

Golgi's silver chromate method of staining shows that this tissue is principally composed of three distinct sets of cell units, superimposed; the outermost being the cells to which the rods and cones belong; the middle the bipolar cells; the innermost the ganglion cells of the retina; each set of cells inter-related with its kind and with the other cell units by conduction relations.

In studying the neuronie architecture of the oculo-cerebral apparatus, one is confronted at the outset with the question, which set of cells in the retina is analogous to the spinal ganglion cells, i. e., the peripheral spinal centripetal neurone?

There are two sets of neurones, the bi-polar and the cell units of which the rods and cones are a part, either of which might be considered the peripheral visual neurone. It is not my purpose to attempt to settle this question; however, it is necessary, in order to conform to our present knowledge of the nervous system, to consider one of these sets to be the peripheral visual neurone.

Barker¹ has selected the former. Certainly there are good reasons for this arrangement. He disposes of the rods and cones by considering them to be analogous to the differentiated epithelial ependymal cells (neuro-epithelial cells) found in the taste buds.

Thus, the bi-polar cells would represent the first order of neurones; the ganglion cells of the retina the optic "nerves", chiasm and optic tracts, the second order; the central ganglia, i. e., the external geniculate bodies, the optic thalamus (pulvinar) and the anterior corpora quadrigemina, the third order of neurones.

The optic "nerve" chiasm and tracts in this classification would be a brain tract, bringing into conduction relations the ganglion cells of the retina with the gray cells of the central ganglia, instead of being considered a peripheral nerve; which conforms to the findings of histologists. (No nucleated cells of Schwann present.) (Glia cells present.)

The axones from the ganglion cells of the retina form the centripetal part of the optic nerve; while the axis cylinders from the ganglia, especially from the external geniculate body, (Flechsig²) form the centrifugal part.

These centrifugal fibers probably have a nutritional function upon the cells of the retina.

A large part of the fibers, (outer root) of optic tract (Dr. St. Bernheim³ thinks 70 per cent.; Monakow⁴ believes 80 per cent.) all of the "visual fibers" (Henschen⁵) and all the macular fibers (Flechsig⁶) pass to the external geniculate bodies.

A cord of axones passes from the former to the pulvinar; (Flechsig⁷) and thence, by way of the posterior third of the posterior limb of the internal capsule, as optic radiations of Gratiolet, to the cuneus.

Henschen⁸ believes many of the axones of the external geniculate bodies pass direct by way of posterior horn of lateral ventricle in the parietal and occipital lobes to the region of the margin of the calcarine fissure.

ANTERIOR BIGEMINA.

Part of the remaining centripetal fibers of optic tract (outer root) go to the anterior corpora quadrigemina, there coming into conduction relations with its gray cells. Axones from these cells pass to the nuclei of the ocular muscles (except external rectus and dilator pupillae) in the roof of the fourth ventricle. These ganglia have a reflex function to these muscles, and do not, in monkey or man, participate in the visual function.

The remaining fibers pass to the pulvinar of the optic thalamus, the visual function of which is in doubt.

THE DIENCEPHALON.

In studying the histology and physiology of the optic thalami and external geniculate bodies, it is necessary to keep in mind the fact of their intimate histologic union; to a considerable extent they should be considered as "one territory" (Schäfer). However, a difference, speaking broadly, of function seems to be established by researches of recent clinico-pathologic observers.

Experimental researches upon the lower animals gave to us our first notions of the function of the diencephalon.

In 1856, Panizza⁹ and Jos. Swan¹⁰, independently of each other, found that destruction of the eye produced shrinking of the opposite thalamus. It is now well known that enucleation of both eyes in a new born animal produces later a degeneration of optic nerves and optic tracts, as well as pulvinar, the external geniculate bodies and the anterior bigemina.

It has also been determined that in lesions of occipital lobe, secondary degeneration has been traced to and found in these ganglia (Von Gudden¹¹), especially in the external geniculate body (Monakow¹²).

From these observations, it appears that these ganglia have for part of their function some "intermediary office" (Schäfer) between the eye and the occipital lobes.

OPTIC THALAMUS.

The exact nature of this intermediary function of the pulvinar of the optic thalamus is in debate. Experimental observers (Rolando¹³, Panizza¹⁴, Ferrier¹⁵ and others) are one in the belief that ablation of one thalamus produces permanent disturbance of sight.

Until recently, Hughlings Jackson, by report of his case,¹⁶ seemed to have settled the question of the visual function of this ganglion. In this case a lesion was found in right pulvinar, not complicated by destruction elsewhere; the visual defect was homonymous hemianopsia.

Henschen, as a result of his clinico-pathologic studies, finds that lesion of one pulvinar does not produce hemianopsia, unless the lesion cuts off or disturbs the visual path, i. e., the optic radiations or the external geniculate body. Sachers¹⁷ reports a case that confirms this view.

EXTERNAL GENICULATE BODY.

Regarding the visual function of the external geniculate body, experimenters and clinicians, with striking unanimity, connect these ganglia with the act of vision (Ferrier¹⁸, Henschen¹⁹, Monakow²⁰, Flechsig²¹, Willbrand²²). Into it pass all the "visual" fibers from the optic tract, and its lesion invariably gives rise to hemianopsia (Henschen²³).

Henschen²⁴ believes that the dorsal part of the external geniculate body innervates the upper part of each retina; and the ventral portion, the lower half of each retina; hence quadrant hemianopsia may be caused by lesions of external geniculate body. The Willbrand case which he reports seems to confirm this view.

INTERNAL CAPSULE OR "CHARCOT'S SENSORY CROSSWAY."

Flechsig²⁵, in his studies in myelinization of the optic nerve fibers, and of the optic radiations, believes that axones from the external geniculate body only; while other anatomists, including Cajal²⁶, hold that axones from both external geniculate body and the pulvinar of the optic thalamus, pass through the posterior third of the posterior limb of the internal capsule, to the cuneus (Monakow) and lips of the calcarine fissure, and (Flechsig) it has been generally assumed that these fibers are visual axones; probably for the reason

that lesion of this region (internal capsule) has been observed to produce hemianopsia.

In opposition to this view Henschen²⁷ holds that these axones, passing through the internal capsule, are not visual fibers; but are optic radiations which have some other function. (reflex function?)

Flechsigs's findings, that there are five times as many fibers in the optic radiations as are found in the optic nerve, would seem to corroborate this latter view.

Henschen accounts for hemianopsia in lesion of the internal capsule, by injury to the external geniculate body or the other parts of the visual path. The visual fibers pass directly to the calcarine fissure by the side of the posterior horn of lateral ventricle with the optic radiations in the parietal and occipital lobes.

VISUAL AREAS.

To Herman Munk²⁹ must be given the credit of the discovery that the extirpation of one occipital lobe in the monkey, without involving the angular gyrus, produces homonymous hemianopsia; and the extirpation of both occipital lobes produces complete blindness.

Subsequently this finding was confirmed by Sanger Brown and Schäfer³⁰ by the method of extirpation on monkeys, with the additional finding, that blindness in the monkey is not permanent unless the lesion extends somewhat in advance of what is generally taken to be the limit of the lobe on the inner and lower surface.

Munk further came to the conclusion that bi-lateral injury of both mesial surfaces of the occipital lobes appears to cause loss of central vision, peripheral vision being intact.

Schäfer further concludes that central vision is especially represented in the anterior part of the visual area, which would be in the neighborhood of the anterior part of the calcarine fissure. He further concludes as a result of his and Sanger Brown's experiments upon the monkey that the upper intermediate and lower zones of visual area of each hemisphere are respectively connected with the corresponding part of lateral halves of each retina.

Munk, Sanger Brown, and Schäfer³² definitely disproved the statement of Ferrier and Yoe³³ that the angular gyri have to do with vision.

These conclusions have been confirmed by more recent observations—Luciani, Horsley, Schäfer etc.

This experimental work laid the foundation for all the clinico-pathologic researches that have subsequently been made. Since 1885 a great mass of evidence has been collected which confirms the findings of the experimenters on the monkey, with some variations and amplifications.

Among the earlier clinico-pathologic observers who put forward the view that the cortical center for vision was situated in the mesial surface of the occipital lobe, should be mentioned Seguin³⁴, Hunn³⁵, Habb³⁶, etc., while the most recent and most important researches in this direction are those of Henschen of Upsala, Flechsig of Leipsig, Monakow of Berlin and Vialet of Paris.

Henschen³⁷ confines the cortical visual center to the region immediately adjoining the middle part of the calcarine fissure. He regards the upper cuneal lip of the fissure as representing the homonymous dorsal retinal quadrants of the retina; while the lower lingual lobe, he believes to represent the homonymous ventral quadrant of the retina; and also he believes the macular center is in the floor of the calcarine fissure.

Flechsig³⁸ agrees with Henschen that the calcarine fissure corresponds especially with the macula lutea, but he also holds that the visual center extends to entire cuneus and lingual lobe.

Monakow³⁹ limits visual area to the cuneus, the lingual lobule and two occipital gyri; also that the macula lutea is represented in both hemispheres and over the whole visual cortex.

Vialet⁴⁰ holds that the region of the calcarine fissure has special visual importance, but he does not admit that the visual center is confined to as narrow limits as Henschen believes. Thus it is seen that the region of the calcarine fissure has most to do with central vision, and further, that the exact boundaries of this area have not been definitely determined.

The axones from cortical gray cells in visual area (corticofugal fibers) pass chiefly to the pulvinar thalami and anterior quadrigemina body of same side and are scattered among other fibers of the optic radiations^{40 1/2}.

HIGHER VISUAL CENTERS.

The region represented by the rest of the occipital cortex (not including the center for vision) especially its lateral surfaces and angular gyri and possibly part of the supra-marginal convolution (Bastian⁴¹ and Gowers⁴²) have a visual concept function.

Injury or lesion of this region produces sensory aphasic disturbances; viz: mind-blindness, word-blindness, verbal amnesia, visual aphasia, amnesic color blindness, color blindness, etc.

Mind blindness is characterized by inability of the patient to recognize persons, or know the use of objects, which he sees and with which he has been well acquainted, although his vision is good.

This condition was first experimentally produced on the dog by H. Munk, by ablation of "certain regions of the occipital lobe," without injury to sight or motion⁴³. By his deductions from this classical experiment he furnished subsequent investigators with a working hypothesis in the theory which he propounded to account for the effect, viz:—that there is a separate center, aside from the visual center, which he terms the "visual memory center," in which are stored up the accumulated memory pictures. Lesion of the visual memory centers or isolation of them from the other sensory centers (Bastian) produces this condition.

It is probably true that a double sided lesion is required to produce permanent mind blindness.

A number of cases of mind blindness have been reported. Swanzy's⁴⁴ case is very characteristic. Mind blindness, I think, should be considered a generic term, under which are grouped word blindness, verbal amnesia, visual aphasia, color blindness, amnesic color blindness, etc., as varieties or partial forms of mind blindness.

Word blindness: This defect is distinguished by the patient being unable to read printed or written words, although spoken language may be comprehended. The theory of a visual word center is necessary to an explanation of the symptoms. This center is probably located in the angular, and possibly in part of the supra-marginal convolution (Bastian)⁴⁵.

This aphasic disturbance may be produced by lesion of

this center or by its isolation from speech center. Differential diagnosis is as yet not established. Cases of congenital word blindness have lately been reported by James Hinschelwood⁴⁶.

"*Visual aphasia.*"—Freund—This form of mind blindness is "a condition in which, though the person quite well recognizes objects or persons, he is unable to call up the name from the visual impression only; but may be able to do so at once, if the visual impression is reinforced by some other sensory impression—by touching the object, smelling it or tasting it, but especially by touching it." (Bastian⁴⁸)

It should be stated that this inability to name objects extends also to current speech (verbal amnesia) so that substantives, and especially proper nouns are avoided because they cannot be recalled.

Gowers⁴⁹, Bastian⁵⁰ and others believe there is only one center for storing up visual memory pictures used in speech, and that is located in the region of the angular gyri in left hemisphere. Freund holds that there are two such centers' one in each hemisphere, and that it is the severance of the paths from both visual memory centers to the speech center (Broca's Convolution) in left hemisphere, that produces typical visual aphasia. Varieties and degrees of this defect depend upon location of lesion Oppenheim⁵¹ thinks there is a special center located in the posterior part of temporal convolutions and anterior part of occipital gyri, and so extensive as to divide the conducting tracts leading from both posterior to the center for tone pictures, in which the visual memory pictures are accumulated for use in speech. Mill⁵² believes a definite area has become differentiated from visual memory picture center, for names. This "naming center," he locates in mid-temporal region. Case reported by author^{52 1/2} seems to confirm this view.

Merkens⁵³ has collected 25 cases of otitic abscess in left temporal lobe, in which aphasic disturbances of different varieties were present in all cases; verbal amnesia (substantives being wanting) was present. He believes the "auditory center," i. e., Wernicke's sensory aphasia center, is at fault, and yet he remarks that (Wortstummheit) word dumbness, is most striking in the cases of optical aphasia. For example, one case could not give name for bell, but on hearing it

ring could give the name. He evidently does not think that there is a special visual center for names; at least, he does not speak of it.

In this connection it should be stated that Bastian⁵⁴ and Gowers⁵⁵ and others hold that verbal amnesia in almost all cases is a result of isolation of auditory center from Broca's convolution or lesion of auditory center in left hemisphere and not due to isolation of, or injury to, visual speech center.

Amnesic color blindness.—Wilbrand and Gamble^{56 1/2} reported cases of this aphasic visual defect. It is the inability of the patient to give each color its name. He can select the color if you give its name; that is, he can perform the Holmgren test. It is always accompanied by right homonymous hemianopsia, which leads Wilbrand⁵⁶ to the conclusion that the cause of the defect is a focal lesion in the left occipital lobe, interrupting the path from the center for color vision (calcarine fissure, Henschen) to the speech center.

Color blindness; hemianopsia for colors (hemiachromatopsia) the light sense being retained, has been observed; also red-green blindness has been reported as an hemianopic defect.

These defects can only be accounted for on the theory that there is a cerebral center for colors, and that this center is in the half-field region, i. e., in the occipital region.

Henschen⁵⁷ believes that the cerebral center for color vision lies in the gray matter bounding the calcarine fissure.

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A CASE ILLUSTRATING THE INADEQUACIES OF
THE PRESENT METHODS FOR THE RECOG-
NITION OF DISTANT COLOR-SIGNALS:
WITH A SERIES OF BRIEF PLANS
FOR REMEDYING THE SAME.

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On a previous occasion,[†] I have made mention of the practiced questions which might arise from the better understanding of George Wilson's aptly, though imperfectly, termed "chronic myopia," or "short-sightedness to colour".[‡] Wilson refers to several cases of subnormal color-perception, in which the subjects were unable to distinguish red from green when these colors were removed a short distance from them, although they could recognize the colors close at hand. In addition, he stated "that a colour blind eye becomes insensitive to red, or doubtful regarding it, at a much shorter distance from a red object than a normal eye does, and ceases to perceive a difference between red and green long before these have become invisible to the perfect eye".[§]

*Read before the December, 1903 meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

†Annals of Ophthalmology and Otology, Vol. V. No. 4.

‡"Researches on Colour-Blindness, etc." By George Wilson, M. D., F. R. S. E., Edinburgh, 1855.

§In ordinary myopia, both the color and the color-saturation of a distant object are discerned before the form of the object: for example, a splotch of contrast color in a distant landscape is visible long before its form is defined. In "chronic myopia" the correct form of the object is seen before its color-equivalent and degree of color-saturation. Study of many of the reported cases of ordinary subnormal color-perception of congenital type shows that such subjects can differentiate gross color equivalents close at hand when they are unable to recognize them at greater distances; particularly is this true under the yellow luminosity of burning carbohydrogen such as candles and common illuminating gas.

A recent case of expert testimony occurring in my private practice, exhibited this condition: The patient, a healthy man thirty-eight years of age, with apparently normal eyes, was a well-known officer in a position involving the protection of life and property by color signals. He stated that he had always been well, and free from all bad habits except the occasional inhaling of tobacco fumes from cigarettes since his thirty-first year.

By reason of a sudden realization of uncertainty in differentiating some important color-signals during a slightly foggy evening, the man found that he had unintentionally committed an absolute though fortunately harmless error. Conscientiously solicitous in regard to his qualifications for his position, he voluntarily submitted himself to a series of color-testings—both by reflected and refracted light—usually employed at one to six meters' distance. All of these (four in number), which were done both authoritatively and in private, he successfully passed, receiving as many certificates, reading "commended for excellent color-vision," "normal color-vision," "test-colors properly matched," and "color perception for red and green good." Dissatisfied because the inability properly to differentiate the signal lights persistently reappeared, during bad and indifferent weathers, and shocked by the previous closeness of accident, he made a personal appeal to his board of management, asking that it exact an expert examination of his color perception in order definitely to decide his inability to recognize the all important colors in their proper positions.

At this juncture, and for this purpose, I was summoned. After obtaining a detailed account of the case, and clinically determining that there was not any gross local or general causative factor at work, I agreed that after a series of examinations done in my own way, I would be willing to submit a report of the findings to the board.

The candidate, an intelligent man, agreed with me upon a course of action; that is, we were to place ourselves during the testings in the actual positions occupied by him while he was at work: and one eye was to be tried at a time with proper intervals of rest.*

*The refraction error was a low degree of farsightedness and astigmatism, with full acuity of vision in each eye, normal accommodation, and proper exterior ocular muscle equilibrium and action.

In order to be certain of the reported findings of his previous tests, I made a number of carefully graded experiments with three series of scientifically chosen wools placed at one meter's distance, and three miniature lanterns held six meters away. The result was, that he unhesitatingly gave apparently proper objective answers to the various coarse color tests used. This work—done with the wools during good diffuse day-light exposure—I repeated with the lanterns at night, and during a stress of bad weather. The latter tests were made with the aid of artificial illumination from candles, illuminating gas (with and without ash mantles, and both naked and incandescent electricity.

I next conducted the testing with the ordinary signal lanterns which had been used by him during his work at night.

By this means we at once discovered the presence of a rather large central area of faint diminution of color-saturation for green and red in each visual field. There was not any positive loss of any of the coarse color equivalents. The thought then occurred to me to repeat this test by daylight in bad weather; this we did, when to his surprise, and to my gratification, the defect became more apparent.*

My next duty was to examine the very colors with which the subject failed during his work and with my tests. For this purpose I obtained the actual specimens of the signal-colors which had been employed by daylight, and the signal-lights which had been used at night and during bad weather. As I expected, I found them dirty, uncared for, unduly proportioned, and improperly tinted. This done, I procured some fresh stock colors from the management; these I substituted for the old ones, and had the lanterns cleaned and replaced. Experimenting with the fresh colors at the usual working distances of about three hundred meters from the patient's post of duty, I again found—though now to a slightly lessened degree, that the candidate re-exhibited his color-defect.

*All possessors of ordinary degrees of subnormal color-perception soon become aware of this fact, and frequently have recourse to artificial illumination abounding in yellowish rays (such as candle light and ignited illuminating gas) to help remedy their defect. Such subjects early avoid the vivid white, the greenish, and the purplish lights such as are produced by oxyhydrogen lime-light, incandescent ash mantels, and arcs of free electricity.

Sure of my preliminary work, I next made my own selections of the variously required colors, and graded them in regard to their proper tintings, their color-saturations, and their relative areas. For the reflected colors, to be used by daylight, I chose a red, a green, a blue, and a yellow tint, which after having been painted and thoroughly dried on the color-boxes were the ones that best matched the mid-lines in the broadest bands of equivalent spectral colors; these ratios being obtained by means of a most carefully gauged and properly heliostated prism. This was done at the very situation in which the candidate was placed during his work.

Two plans to render the four reflected colors which I intended should be employed during these experiments, equally distinct at their one distance, were next tried: one, which was almost immediately abandoned, was by having the saturation of the colors made correspondingly variable by changes in brightness and differences in degree of luminosity: the other, which was adopted, was by grading the relative sizes of the color areas.* As a result, the presence of a lowering of the color-sense in the central portion of the visual fields not only for red and green, but also for *blue* and *yellow*, and even *white*, particularly noticeable at the distance that had been employed by the candidate during his work was shown.†

It remained necessary to prove the tests in a way which would render them intelligible to a number of educated laymen, and prepare them to be exhibited in a manner that would be appreciated. This was quickly and easily done by comparison and contrast with the ready and correct objective answers given me by two similarly positioned officials, who after repeated trial with the same methods, were found to possess normal color perception for both near and far.

*Having previously made a series of careful studies upon the minimum exposures of the reflected colors, red, green, blue, and yellow, for recognition at six meters' distance, the data that had been obtained were adapted to the new studies. (Archives of Ophthalmology, Vol. XI. No. 1.)

†Quite recently, I have cursorily tried this subject with my modification of the Abney pellet-test, and have found him quite uncertain during several of the trials—thus proving the value of the test in quickly exposing relative central scotomata during near vision.

The report was presented and the demonstration was made. As a result, the man was removed to a post where color perception was not necessary to his work.

REMARKS. Here was a man, who without any family or personal history of gross hereditary malformation or disorder, and one who was devoid of any acquired disease, evidently was the possessor of a minor degree of some form of retrobulbar neuritis, which was the cause of the appearance of ordinarily unnoticed negative central scotomata in the two visual fields, as the only signs of a disturbance that possibly had been caused by the tobacco which he had used.* In other words, there were defects of vision which became noticeable to the subject only when the visual organs were placed under the usual condition of delicate color-differentiation; a condition which, unfortunately, was the vocation of one who was responsible for the safety of life and the protection of property; a vocation which was dependent solely upon a normal functioning visual apparatus.†

Analyses of the methods ordinarily employed for the estimation of subnormal color-perception among employees of railway, army, navy, and marine service, at once evidence their inadequacy. Here, in a class of skilled workmen whose sole fitness for the protection of life and property is the correct recognition of color at safe distances, the tests to determine the character and the degree of the functioning power of the visual organs, are improperly applied.

Without entering into a detailed description of these inefficiencies, it will be necessary only to arrange the best plans for their removal into a series of aphorismic captions; following these with a number of general rules for the prevention of the errors; and concluding with suggestions for the formation of both a national and international commission for the control and supervision of the matter.

First. The methods for color-testing at present pursued in railway, army, navy, and marine service, are inefficient for the detection of many cases of low degrees of subnormal

*Other forms of causative toxic agents were carefully excluded before this conclusion was reached.

†The thought arises, may not woman by reason of her higher grade of physiological color-perception and better habits, be a more competent color official in many situations which are devoid of undue exposure and dangerous risks to herself.

color-perception; a type which necessarily constitutes the most dangerous and the least suspected class of subjects.

Second. Every candidate for color-testing, no matter in what capacity he may be employed, should be medically proved to be free from injurious habits systemic disturbance, and ocular disease, before any such tests are applied.

Third. Accurate notes of the character and degree of color-sense which may be obtained in duplicate by any authorized management, should be kept and added to at regular intervals.

Fourth. All testing for color among railway, army, navy, and marine employes should be conducted in the very situations which are occupied by the subjects during work.

Fifth. All testing for color among railway, army, navy, and marine employes must be done with the test colors placed at the distances which are employed during signalling.

Sixth. All color testing among railway, army, navy, and marine employes must be performed during the various stresses of weather to which the candidates are subjected while on duty.*

Seventh. All color-testing among railway, army, navy, and marine employes must be done during the times of day and with the illuminating exposures that are used by the candidates in their daily employment.†

Eighth. All testing for color among railway, army navy and marine employes should be done with adaptations of the materials that are to be gazed at by the candidates in their regular work.

Ninth. All of the test colors must be kept at uniform

*It is most interesting to note how quickly even the normal eye loses its sensibility to impressions of red light. Particularly is this true during rapidly fading twilight and with an eye possessing a slight degree of subnormal color-perception. The variability of both actual tone and saturation when a color is seen through a volume of escaping steam must not be forgotten: so too with complementary after-images and faults of recognition of faintly perceptible signal lights from, for example, persistently gazing into red glowing fire-boxes.

†England has some of its most important railways protected by the Abney system of carefully selected red and green color values which have been made to conform with the character and the nature of the artificial illumination used.

standards of relative distinctness, saturation and brightness for the distances ordinarily used; for example, there should be a series of three-hundred-meter-colors, five hundred-meter-colors, one-thousand-meter-colors, etc.; for both daylight and artificial illumination.*

To accomplish this successfully, is to remove the loose color selection to a safe distance. This can be easily done in railway service, as has been previously shown† by having the four colors, green, red, blue and yellow, which are used for signalling made in definitely sized and relatively graded areas of just sufficient size to be properly and simultaneously recognized by a normal visual apparatus at the distance of one hundred meters, three hundred meters and five hundred meters. These areas should be arranged in a row upon a beam placed several feet above a series of related pure and confusion tints, of carefully graded sizes, strung along a horizontal beam situated about six to eight meters above the ground. Each match-area is to be known to the examiner by the initials of its contained color. Both the test and the match-colors can be placed in any desired order at the time, and this order marked consecutively upon a numbered blank. The candidate is then to stand at the specified distance from the testing apparatus and is to be requested to register upon the blank the nearest matches upon the lower beam to one of the upper test colors, expressed in the numbers of the improvised order. This is to be done with one size at a time and is to be repeated with each test color. If proper care be taken to guard against intercommunication, this procedure can be simultaneously accomplished with a dozen or more candidates.

Similar experiments with signal lights which have been properly tinted, gauged, illuminated, and placed in the same apparatus, should be made by night and during varying kinds of weather, thus placing the candidate in the position and under the same circumstance in which he is situated while working.‡

*A red light of equal size with a green one, will when placed together at a given distance, appear in good weather much further away, thus tending to give miscalculations in actual distance.

†Transactions of the American Ophthalmological Society for the year 1888.

‡Vide P. 195. A Text-Book of Ophthalmology, by William F. Norris and Charles A. Oliver.

For a practical trial of the method while the candidate is at work upon a moving train, the apparatus may be arranged over a number of experimental tracks, and a trial engine run rapidly, slowed, and stopped, in accordance with the individual wishes of the examiners.

For merchant and marine service, army signalling, etc., suitable modifications can be adopted. Here the contingencies are not so great as in railway work, though there is much danger in marine and naval service where it is difficult to bring large floating masses to a rapid stop, and where there is not any fixed track in a course that is oftentimes fog laden and busily occupied. In army signalling, more time as a rule can be granted, since the signs do not generally mean instantaneous action; here there is time for deliberation.

All the work should be done quietly and unconcernedly, as all such subjects become increasingly uncertain in their decisions if any action is taken of their mistakes during the examination. Apparent confidence must be assumed, and the candidate, if afflicted, will soon become his own accuser and hence be better satisfied with the verdict.

It will thus be seen that if these plans be faithfully carried out, no one who is in the least inadequately equipped, can be admitted to a position in which color differentiation at a safe distance is an absolute necessity. Once passed by this method and periodically proved, it may safely be asserted that such visual apparatuses possess not only the power of differentiating gross color changes, but also have the ability of distinguishing normal relative saturation of individual colors, under varying conditions of weather and time of day; the proof of a piece of perfect color mechanism for such work.

The visual apparatus thus found fitted for its required work, should have accurately constructed and properly continued signals, etc., furnished for use in its daily employment, i. e., all test and signal material must be kept fresh and clean; every series of signal colors (both for reflected and refracted light) for any definite distance, must be considered, and individually tested in their actual positions; and the character of the illuminants in regard to their predominant color-value,

*The slight advantage that is gained in color-saturation by yellow carbon-light, is quickly lost when the test object is gradually removed to a distance that in actual work is compatible with safety.

their fixity, and their degree of intensity, must be obtained in each particular situation.

Taking for granted for the moment that color signals, and hence color tests must be employed under all manner of conditions, and that a scientific uniformity in the whole subject is an absolute necessity, it alone remains to see that this is properly and authoritatively carried out.*

*The recent suggestion to make green the safety color, yellow the caution color, and red the danger color (which has already been done upon some railways) making the two extremes of action "go ahead" and "stop" dependent upon the two most ephemeral colors that we possess, renders this reform more necessary.

As I have had previous occasion to say, "all that has been written here, is equally as true for the so-called traction trolleys which run at such high rates of speed, especially in the suburban districts and so rapidly and frequently change passengers. For this class of employes, as a rule, applicants are selected for duty both as motor-men and conductors, with an utter disregard not only as to their color-vision, but, as to their other visual functions."

KERATO-CONUS.

By G. GRIFFIN LEWIS, M. D.,

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OPHTHALMIC SURGEON TO THE HOSPITAL OF THE GOOD SHEPHERD
OPHTHALMIC AND AURAL SURGEON TO ST. MARY'S MATERNITY
HOSPITAL; OPHTHALMIC AND AURAL SURGEON TO ST. VIN-
CENTS ASYLUM; MEMBER OF THE SYRACUSE ACADEMY
MEDICINE; THE CENTRAL NEW YORK OF MEDICAL
SOCIETY; THE ONONDAGA CO. MEDICAL SOCIETY,
ETC.

Kerato-conus is a peculiar pathological condition of the cornea in which it gradually becomes more or less conical in shape without any accompanying inflammation, pain, loss of transparency or other ocular symptoms excepting a gradual failure of vision.

It is much more prevalent among females and, when not congenital, usually begins between the tenth and fourteenth years of life, though often earlier, and proceeding very slowly reaches its climax within from five to seven years. In any degree it may become stationary, permanently or only for awhile, and then undergo rapid increase. In some cases it may attain remarkable proportions. Dr. H. D. Noyes reported a case a few years ago which measured $\frac{3}{4}$ of an inch in length.

As a rule both eyes are affected but one usually in advance of the other. When monocular it is usually very slight. The cone almost invariably points below the center of the cornea, which fact is probably due to the pressure of the upper lid, and it never advances to bursting by extreme stretching, ulceration or sloughing.

Cases of kerato-conus are comparatively rare, so much so that many cases are not likely to come under the care of one surgeon and it is usually well advanced when the unfortunates seek professional aid. According to the statistics of six of the largest ophthalmic hospitals in the United

States there is only on an average, one case of kerato-conus to every 7206 eye cases.

Literature on the subject is also very meager. The *Index-Medicus* during the eight years from 1891 to and including 1899, only gives a total of six original articles, six reports of cases written on this subject throughout the world. The older works on Ophthalmology treat more exhaustively of it than do the more recent ones. Bowman, Critchett and Knapp perhaps have been the three most generous contributors of literature on the subject.

The causes of kerato-conus may be classified into two groups, constitutional and local, the latter being dependent on the former. Heredity seems to figure somewhat in the etiology of this disease as Bowman and others have reported several cases in the same family. Mal-nutrition and feeble muscular conditions brought about by severe or protracted illness, over rapid growth, phthisis, feeble circulation, scrofula, anemia, chronic dyspepsia and menstrual disturbances have been observed to be associated with the development of conical cornea. The fact that it is more prevalent in females and that the period of puberty is the usual time of its incipency points very strongly to menstrual disturbances as one of the leading factors in its causation. Typhoid fever, before or at the age of puberty, may bring about this condition. Derby says—"That considerable general change may take place in the system at large as the result of typhoid fever was first brought to my notice years ago by the study of a case where an emmetropic patient went to bed with an attack of typhoid fever, remained six weeks, and arose with a marked and persistent change of myopia." The immediate local cause is the disturbance of the relation of the intra-ocular pressure to the resistance of the cornea, which may be due to one or more of the following conditions:

- (1) Mal-nutrition, atrophy and diminished resistance power of the center of the cornea which is farthest from the blood supply.

- (2) Incomplete development of the center of the cornea which during foetal life is the last part to be formed.

- (3) Muscular tension of the external ocular muscles, which in some cases have been known to exist before the conical condition of the cornea developed.

- (4) Eye strain with the associated intra-ocular congestion

and relative increase of tension. If the ciliary muscle plays an important part on the tension and alterations of the corneal curvature and if astigmatism may, in some instances, be the direct result of such action, and that too upon the healthy cornea, why should not a severe and long continued spasm of accommodation eventually produce a conical condition of a weakened, undeveloped or badly nourished cornea?

We know nothing definite of the pathology of this malformation of the cornea but there is no doubt but that the bulging is preceded by an atrophy of the central part of that membrane, which is farthest from its source of nutrition. Whether this atrophy of the membrane is caused by defect or deformity from birth and yields to internal pressure in youth is still an unanswered question.

Dr. His found by experimenting upon guinea pigs that when he scraped the epithelium of the cornea off, that membrane became cloudy and protruded, and that although the cloudiness cleared up after a while the protrusion remained.

Dr J. A. Spalding says, "In the absence of pathological alterations subsequent to keratitis I should be inclined to attribute the cause to softening of the corneal tissues from dyscrasia similar to that which gives us white swelling of the knee; the so-called scrofulous—for lack of a better word."

Ranpoldi concludes from a microscopic examination of an eye affected with kerato-conus that the changes in curvature must be sought in alteration of Descemet's membrane and its epithelium, which changes are dependent upon constitutional conditions. Bowman states that the changes are confined to the laminated tissues of the cornea, as in the specimens which he examined microscopically the posterior laminated and the epithelium both on the front and on the back of the cone were unchanged.

When the disease is far advanced the increased friction and the exposure of the apex sets up an interstitial keratitis but bursting never takes place. This is no doubt due, as Bowman says, to the exosmosis of the aqueous through the thin cornea thus reducing the inter-ocular pressure so that it is no longer in excess to the diminished corneal resistance. In its earliest stages there are only subjective manifestations such as diminished acuity of vision and symptoms of asthenopia, and unless we examine very closely we will overlook the true condition. Subsequently however the bulging will be sufficient-

ly advanced as to give a peculiar brilliancy to the eye like a drop of molten glass deposited upon the corneal center and the pupil is apt to be large and sometimes the iris is tremulous.

The ophthalmoscopic picture of the fundus will make the vessels appear broken and twisted. In the more advanced stages the cone may be easily seen through the closed lids as the ball is moved in different directions. The ciliary vessels may become somewhat congested and the apex may grow more or less cloudy.

The accurate estimation of the refraction in these cases is very difficult on account of the distorted and wave like sides of the cone. Vision can never be brought up to normal and in the pronounced cases glasses are of little or no use. Those cases in which vision is improved by the use of eserine or by the pin-hole disc are usually benefitted by glasses. It is generally assumed that the general refraction in kerato-conus is myopic. This may be so in the majority of cases but fully one third have hyperopic astigmatism, at least in one meridian. In handling these cases we should not be governed by the precise rules which usually aid us in the correction of refractive errors and place too much reliance upon subjective methods but should rely upon objective measurements. As Mackay says "The problem before us is to estimate the actual state of the refraction through a small area of the cornea situated as near the visual axis as possible." With this object in view it is best to examine the eye first with a dilated pupil, then with a contracted pupil. The direct ophthalmoscopic method is of no assistance. Retinoscopy, however, is valuable and upon it we can depend more than on any other method. A peculiar shadow on the side of the cone opposite the light, which circles around the cone as the mirror is moved from side to side, is characteristic of kerato-conus. This shadow may confuse us somewhat in our efforts to ascertain the refractive condition but by using a disc with an aperture of from 3 to 5 mm. in diameter, thus screening from view every part of the cornea except the limited area which we wish to correct, the process is very much simplified.

The ophthalmometer and Placido's disc are also great helps in selecting the clearest part of the cornea. Often convex cylinders are accepted. In some cases convex cylinders

placed at right angles to concave cylinders will give better vision than sphero-cylinders. In those cases which remain stationary stenopaic appliances sometimes render effectual assistance but are not satisfactory for constant wear as they shut off too much light and contract the visual field. This objection may be partially overcome by having a disc pierced with a series of small holes like the cover of a pepper box. Snellen constructed a pair of discs with a stenopaic slit running from left to right and ending in the middle with a sharp point, thus enabling the patient to read when the point in the slit is brought just in the visual line. Helfrich reports a case of a young boy who devised a lens consisting of a plain glass with a horizontal black strip across the center, the width of which was sufficient to shut off those rays of light which would naturally infringe on the conical part of the cornea. With this glass his vision was improved from 5/200 to 20/50. All these appliances, however, are very much objected to on account of their unsightliness.

Raehlmann was the first one to recommend the hyperbolic lens which in most cases, improves vision remarkably as long as the visual axis corresponds to the apex of the lens but as soon as the patient turns his eye the least to one side the condition is worse than before. For this reason they are more suitable for close work than for street wear. The same objection pertains to the conical lenses recommended by Angelucci. The contact lens suggested by Hershell, which fits on to the front of the eyeball somewhat like an artificial eye, also improves the vision very much but irritates the eye and is not long tolerated. The treatment of conical cornea is, as a rule, of a very unsatisfactory character and relief is only relative. Some cases have been arrested in the early stages by a general alterative treatment, absolute rest, avoidance of violent physical exertion, open air, good food, hygienic surroundings, digital massage, correction of refractive errors, compress bandages, mydriatics, myotics and astringents. Culver reports good results from the use of thyroid gland. Surgical intervention is to be advised only after other methods have failed and the patient is reduced to a state of helplessness, for the surgical treatment of conical cornea, besides being a tedious undertaking and beset with dangers, has certain cosmetic drawbacks and doubtful gain. Sir William Bowman was the first one to attempt to correct

the optical defects of conical cornea by an operation. Having noticed the improvement in vision afforded by the stenopaic slit he endeavored to supply the latter permanently by performing the operation called iridodesis, or changing the pupil into a vertical slit by drawing the papillary margin into the corneal wound and leaving it there. This operation improved vision considerably in some cases but it occasionally provoked cyclitis and sympathetic trouble. Von Graefe had good results in some cases by shaving off the apex of the cone without entering the anterior chamber and then applying a stick of mitigated silver caustic to the cut surface, thus producing an ulcer and eventually getting cicatricial contraction. This method was very painful and not infrequently set up a cyclitis. Bowen next invented a small trephine by which he removed a disc from the summit of the cornea. De Wecker also adopted this method and for years this was the favorite plan of treatment. Critchett then conceived the idea of removing a small elliptical piece of cornea at the apex allowing the wound to heal without sutures. This method is also still practiced by many eminent ophthalmic surgeons.

Dr. J. W. Buller described a case in 1897 in which he got an excellent result by passing a Graefe blade vertically through the apex and bandaging, then one week later passing the blade horizontally through the apex, removing a small piece of the cornea with a pair of iris scissors and bandaging again.

Repeated evacuations of the aqueous humor have been employed more or less for many years but without any pronounced result.

The method most generally adopted of late years, and the one which is the least painful in its application and the least liable to subsequent complications, is cauterization of the apex with the actual or galvano-cautery. This may be applied in various ways. Abadie burns a deep furrow at the upper edge of the cornea. Callan cauterizes at opposite points to the greatest curvature going down into the membrana-propria of the cornea and repeats the procedure if necessary. Noyes recommended cauterization of the cone without perforation. Weeks uses the same method. The great majority of operators, however, seem to favor Knapp's method of first cauterizing the apex with an oval electrode

and then piercing the eschar with a fine pointed electrode. This method is performed as follows: After dilating the pupil with atropine and cocainizing the eye an assistant gently raises the upper lid, as no speculum should be used or pressure exerted upon the eyeball. The oval electrode is placed cold over the apex and withdrawn as soon as it has been brought to a red heat. Then with a needle electrode, the size of which depends upon the amount of contraction desired, the center of the apex is pierced and the needle quickly withdrawn so as not to heat the aqueous too much and produce a traumatic cataract. For the same reason the electrodes are not allowed to reach a white heat but are withdrawn as soon as they are brought to a red heat. This method is easily performed, does not result in anterior synechia, allows rest and contraction of the cornea by the slow and continuous drainage of the anterior chamber and leaves a small scar. A moderately tight bandage is kept on most of the time following this operation and the increased tension which is liable to follow may be combated with eserine. A few cases of cataract, cyclitis, or even panophthalmitis have been reported to have followed this method but thus far it has been productive of more good results and fewer bad ones than any other and may be now considered the classic treatment. In cases where a somewhat extensive eschar has been unavoidable it may subsequently be necessary to make a small artificial pupil in the line of vision, preferably inward and slightly downward.

Vision and appearance will also be somewhat improved by tattooing the corneal opacity with India ink providing that membrane is not too thin to admit of it.

THE NECESSITY FOR THE ANNUAL SYSTEMATIC
EXAMINATION OF SCHOOL CHILDREN'S
EYES, EARS, NOSES, AND THROATS,
BY SCHOOL TEACHERS.*

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There are in the United States over fifteen million school children, ten million of whom are suffering from some eye, ear, nose or throat defect, which if relieved will place them in much better condition to undergo life's struggles, and to achieve a measurable degree of that success which produces self respecting citizenship, and relieves the state, county or town of burdensome pauperism. No flight of fancy is required to transform the defective child into the non-supporting "ne'er do well," the wandering and menacing tramp, or the idle, pleasure seeking, and misery finding prostitute. The evolution is natural and consequential, and stands as an enduring monument to the benignity of education. A child whose educational progress is embarrassed or almost stopped by reason of physical defects may soon acquire a loathing for education and all that education represents, and the seeds of idleness and irresponsibility thus being sown, may, unless energetically and tactfully controlled, either by parental or surrounding influences, fructify and produce a personality ripe for sinister inoculation. If, therefore, the State can eliminate, control or mitigate the existence of such physical defects in children, and by its parental supervision place such children in a position of reasonable equality with their healthy companions, thus affording them fair opportunities for educational progress, its duties become unmistakably clear, and its investment of public funds for the consummation of

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such designs, a laudable measure of unquestionable economics. If the direct causes of criminality and pauperism could be accurately ascertained, I will venture the opinion that the prevailing etiological factors would be physical defectiveness and social surroundings. If therefore, either of these can be even materially mitigated, a distinct impression would be made upon criminal and pauper annals, and the problem would become one to be worthily considered by the economist, philanthropist or sociologist. The improving of either physical defects or social surroundings in *adult* life, is a problem of almost hopeless perplexity, while if these foes to social prosperity be attacked in the budding periods of human existence, the difficulties are immeasurably mitigated.

Concerning the last of these mundane misfortunes, or the social surroundings of individuals, this paper will have nothing to say, but as a medical man I am intensely interested in the second proposition referring to physical defectiveness, and I sincerely believe that if the relievable bodily abnormalities of children could be eliminated a mighty factor encouraging idleness, poverty and crime, to say nothing of human suffering, would be driven forcefully to obscurity.

"Prevention is better than cure" is an old adage, and is nowhere more truthfully exemplified than in the subject under consideration. The adage might be somewhat altered to read "Prevention is possible a thousand times, while cure is possible but once" and still not stray very far from the truth. So true is this that almost all great reform and philanthropical movements tending toward the physical, mental, moral and sociological uplift of humanity, are surely and inevitably endeavoring to grapple with the subject in the earliest years of children, before the withering and decadent breath of human degeneration has rendered upward and improving conditions well nigh impossible.

Perhaps nothing more surely indicates the nobility and unselfishness of the medical profession than its recognition of these principles, and its beneficent work in the direction of preventive hygiene and medicine. Its best efforts are directed toward the elimination of disease, thus presenting the only instance in professional or commercial life where strenuous efforts are made to destroy one's own income. While it would be most interesting and instructive to dwell upon the various bodily infirmities of children that militate against their in-

tellectual, moral and sociological advancement, the space allotted for this paper is all too short to permit of such a digression. The title of my paper indicates that I have come to speak to you upon those ocular and aural defects which deter or prevent the afflicted child from acquiring those educational advantages which properly equip him for the great battle of life, the struggle for existence.

Come with me to the clinic and see a poor child of perhaps some foreign extraction. Notice its attenuated form, its pinched countenance, its bloodless, illy-nourished appearance its unintelligent, unresponsive aspect, all indicating insufficient nutrition before and after birth, and general lack of proper food, air, care and hygiene during the brief span of its miserable existence.

Examine its eyes with your test-types and ophthalmoscope, and you will perhaps find myopia or hypermetropia of enormous degrees, or a congenital cataract; either doubtless due to pre and post-natal starvation, and general neglect. Place this child in a school where physical defects are unrecognized and watch the results. He is unable to see distinctly and headaches, pain and general discomfiture follow all his efforts at study. He cannot even see the blackboards and charts, printed books are indistinct or seen with much effort, the faces of his teacher and comrades are blurred, he does not know what is the matter, but he finds it impossible to keep pace with his fellows, and he acquires a hatred for school; his endeavor to acquire an education becomes abortive, he falls behind his class, becomes discouraged and truant, and finally gives up the effort, joins the ranks of street gamins, develops criminal tendencies, is sent to a reformatory that does not reform, and may easily end his life in the penitentiary or on the gallows.

Pass from this defrauded child to another of similar miserable appearance but with an unusually stupid countenance, produced from enlarged tonsils or adenoid tumors in the throat, which prevent proper nasal breathing, and cause him to keep his mouth open in order to breathe. Eventually he becomes deaf either through obstructive and catarrhal influences or on account of chronic or middle ear suppuration, which is an actual and constant menace to his life. His general open-mouthed, unintelligent countenance, coupled with his deafness, lead him to be considered stupid, if not idiotic,

an impression which is daily strengthened by his poor educational progress, impossible to overcome, through his unfortunate physical infirmities. Eventually he, likewise neglects his studies, hates his school, becomes a street habitué, idle and dissipated, and may easily terminate his existence amid crime and its consequences. These are no fancy pictures which I have painted in lurid hues for your delectation, to point the moral of my theme. They are true, living, breathing, pulsating facts that must be familiar to every student of hygiene, criminology, or sociology. If education is worth anything in the broadest sense, and if it passes beyond the borders of dilettanteism, into the broad realms of those influences which stand for human uplift, then it should reach down, down to the very dregs and bottom of the social scale, and pull up the *most* unfortunate of the human race, and place them on a par with their fellowmen. You and I both know that education *will* perform this great evolutionary process, and I claim that is the inalienable, in-born right of every citizen of this great, magnificent Republic to be placed in a position where an education may be acquired. I also claim that inasmuch as we must look to education to solve many of the criminological and sociological problems of the day, and that the more knowledge is diffused throughout the length and breadth of this land, the happier and better will the land become; that it is the distinct, moral and economic duty of the State to see that educational advantages are afforded wherever such conditions are in any wise possible. I further believe that wherever obstructions exist blocking the way toward educational acquirements, they should, as far as possible, be dissipated by those guardians of the public welfare having such matters in charge. I believe that public school officials should maintain a strict surveillance over the physical as well as over the intellectual and moral welfare of those children committed to their charge. A large portion of a child's life is spent in school and teachers should, and I believe do, take a sincere and watchful interest in the bodily condition of their pupils. The necessity of such observation is the more accentuated, because a large proportion of such children come from homes of ignorance, filth and vice, where mothers and fathers apparently care but little for their offspring, and evidently desire to shirk all possible moral responsibility. Under such circumstances the

burden should fall upon the shoulders of the State authorities, both medical and educational, whose best endeavors should be taxed in vigorously officiating as both father and mother to those poor unfortunates whose earthly advent has been signalized by distress from birth to older years.

While it is not my intention to unduly magnify or exaggerate the importance of any particular physical defect, and its baneful influence in hindering educational acquirements I believe it safe and conservative to declare that aside from mental capacity, nothing is so essential to intellectual progress as sight and hearing, and of these the former must claim the principal position.

It is, therefore, to these two functions of special sense that particular reference will be made in this paper, and while I will not burden you with a large and formidable array of statistical truths, that are now so well understood as to render recapitulation unnecessary, I will trespass upon your time and patience for a brief space of time in order to clarify in your minds, and the minds of others, the history and motives for the tests; a detailed description of which will be given toward the close of this article.

The examination of school children's eyes by regularly appointed ophthalmologists is no novelty. It has been done many times by numerous workers, and conspicuously by Cohn of Germany, and Risley of Philadelphia. The plan of ocular inspection by ophthalmologists, however, while ideal in theory, possesses the disadvantages of the great and unnecessary expenditure of public funds, and the inevitable production of much professional friction. Concerning the first objection: it must be apparent that competent medical men could hardly devote such large amounts of time to annual investigations of this nature, which would practically consume the time of several men in large cities, without at least some compensation, which would necessarily add materially to the school budget, and certainly incompetent men would be undesirable. Relating to the second objection bearing upon the production of professional disturbance and friction, should one or several ophthalmologists be selected to personally examine all public school children in a given city, it can only be said that such conditions would be but natural and human. The power thus placed in the hands of one man, or several men, would be enormous, and

the opportunities for personal aggrandizement and gain professionally and financially, so great that but few men could successfully withstand the temptation. It seems unnecessary to dwell at length upon this point, but to physicians who understand such matter throughout their diverging and converging pathways, the objections to the plan of personal inspection of all scholars by practicing physicians seem almost insurmountable. I, therefore, February 6th, 1895, in a paper read before the Minnesota Academy of Medicine, proposed a plan for the *annual systematic* examination of school children's eyes by *school teachers*, which was shortly after placed in operation in the public schools in Minneapolis, St. Paul and other Minnesota cities. Dec. 30, 1897, I read a paper before the Associated Minnesota School Boards in St. Paul, in which I proposed that not only the *eyes* of school children should be annually examined by school teachers, but that the *ear, nose and throat* should be also examined through the agency of a few simple, pointed and pregnant questions and observations. This paper was supplemented by another, which I read April 9, 1898 before the Chicago Teachers' Club, in which I introduced a new testing card, combining in convenient form not only the Snellen test letter, but also minute and explicit directions to teachers, as to how the tests may be made. The salient features of the test are that they shall be *systematically* performed *each fall* by *school teachers*. I say "systematically performed" because they should be made as regularly as any other school function, as otherwise their efficacy is almost lost. Many teachers imagine themselves to be enacting their complete duty when they maintain a general supervision of their pupils' ocular and aural condition, observe palpable defects and occasionally refer their pupils to certain medical advisors. This is good, as far as it goes, but it is totally inadequate as a substitute for carefully arranged questions that, when answered, will disclose the existence of ninety per cent. of serious eye, ear, nose and throat diseases.

The occasional superficial and unsystematic observation of pupil's eyes and ears cannot be safely substituted for thorough, stereotyped tests that have been thoughtfully and intelligently framed for the detection of disease; and yet many ignorant but well-meaning teachers feel that comprehensive

hensive annual tests are entirely unnecessary, forgetting the fact that while conspicuous departures from health may be evident to a casual observer, many serious but hidden conditions are only detected by minute and careful examinations. Besides this, unless the tests are distinctly expected from each teacher, many children will escape thoughtful observation of even the most limited character, for while most teachers take a deep interest in their scholars, and conscientiously endeavor to promote their interests in every way, intellectually, morally and physically, still teachers are frequently seen who regard their profession lightly, and endeavor to get through each day's work with as little personal effort as possible. Under such circumstances, it is certainly too much to expect that much time will be given to the investigation of the physical condition of pupils, and the child is, therefore, nearly as much neglected, or subjected to nearly the same degree of lack of intelligent supervision, as can be found in many of the squalid homes of public school children. The tests, therefore, should be uniform and systematic, and should annually include *all* pupils above the first grade, as it has been found impossible to satisfactorily examine quite young children. Some teachers have the impression that a child needs only one examination, but inasmuch as eye, ear, nose and throat diseases may develop from year to year in previously perfectly healthy children, it is essential that each annual test shall include all children, above the first grade. The tests should be made early in the fall of the year, and should become an integral part of the regular school curriculum. By making the tests shortly after the opening of the fall term, the physical condition of pupils is early ascertained, and steps can be taken toward the correction of any existing abnormalities. Should parents be warned of the presence of physical defects in their children, and fail to act upon such warning, the teacher will have ample opportunity to counsel child and parent concerning the necessity of a medical consultation, which would hardly be possible if the tests are postponed till the close of school in the spring of the year. Besides this the fall tests will have the advantage of enabling the teacher to co-operate with the physician, in the execution of his advice, and to observe the results of treatment in the afflicted children.

Some objections have been raised to the examinations

being made by school teachers; some feeling that parents would object, others that teachers are incompetent, and still others that it is an unjust tax upon the time and energy of the teachers. Concerning the first of these objections: its triviality is almost sufficient for its dismissal, and it need only be said that the tests are absolutely harmless and painless, that no instruments or appliances are used, and that the child is practically not even touched during the examination. Should any child or parent object, however, acquiescence to their wishes should be observed, as compulsion is undesirable, and clashing with parental authority should always, if possible, be avoided. Concerning the incompetency of teachers, I have only to say that anyone who is competent to be a teacher, can make the tests with perfect ease. They are absolutely simple and uncomplicated, consisting of such questions as "Does the pupil habitually suffer from inflamed lids or eyes?" "Is the pupil probably 'cross-eyed?'" "Does the pupil fail to read a majority of the letters in the number xx (20) line of the Snellen's test types with either eye?" "Does matter (pus) or a foul odor proceed from either ear?" "Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room?" etc., etc. The ascertaining of simple facts of this nature does not require a medical education, and can easily be compassed by anyone of ordinary intelligence and tact, and strange as it may appear, correct replies to the nine questions specified in the examination instructions, will disclose the existence of at least ninety per cent. of serious eye, ear, nose and throat diseases. For instance the question "Does the pupil fail to read a majority of the letters in the number xx (20) line of Snellen's test types, with either eye?" will disclose the existence of myopia, and many causes of hypermetropia and astigmatism. It will also detect cataract, corneal opacities, optic neuritis and atrophy, many diseases of the vitreous, retina and chorioid, etc., etc. The question "Does the pupil habitually suffer from inflamed lids or eyes?" will detect inflammatory diseases of the cornea, conjunctiva, lids, sclera, iris, etc., etc. The question "Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room?" detects all forms of deafness, whether due to ear-wax, catarrh, labyrinthine, or middle ear disease, etc. The question "Is the pupil an habitual mouth breather?" discloses turbinate

and septum diseases, polypi, adenoids, enlarged tonsils, etc.

It will, therefore, be seen that notwithstanding the extreme simplicity of the questions, they are most comprehensive in their character, and are capable of detecting a vast majority of serious eye, ear nose and throat diseases, and while the teacher cannot, and should not, attempt to make a diagnosis of the pupil's malady, she will at least know that *something* is wrong, and this is quite sufficient, the physician consulted will do the rest. In case some abnormal condition is disclosed by the tests the teacher sends the parent a card of warning, stating that some disease is believed to exist, which is not only unfortunate for the child, but will retard the progress of education, and advising the parent to consult the family physician or some specialist, either at the office or free dispensary. It will thus be seen that there is absolutely no reason why an intelligent teacher should feel at all incompetent to make these tests, and it is earnestly hoped that this objection will be now relegated to obscurity.

Concerning the objection to the tests on the ground of its being an unjust tax upon the time and energy of teachers: I have only to say that if the tests are made according to my instructions, this objection is quite as valueless as the others, to which reference has just been made. Some years ago when the tests were first introduced, the school principals personally performed the work, which, when it is remembered that in many of the city schools there are perhaps 2,000 scholars, become quite a burdensome and protracted labor. I now advise that each teacher examines the pupils in her or his own room, and as there are rarely more than fifty children in a room, the extra work imposed is certainly quite inconsiderable, and can be easily performed by either keeping a few children after school, each day for a week, or, what is much better, having a regular half day set aside each fall, by the school superintendent, to be devoted to the tests. In this way it can be seen that the tests can be easily finished in a week or a day, according to the method adopted, for from three to five minutes to a pupil is all the time that is required, and by thus systematizing and subdividing the work amongst the room teachers, all the pupils in a city can be examined in the time specified. Some have suggested

that the work be done by school cadets, and this is not a bad plan, but inasmuch as the room teachers live in closer contact with the children and come to learn their physical defects by daily observation, it would seem as if they were better qualified to answer the questions propounded in the tests, than anyone who might be otherwise designated for the work. I further believe that instead of the tests imposing extra work upon already overworked teachers, that in the end their labor will be materially lightened; for many defective children, who from apparent stupidity induced by unrecognized eye or ear defects, obstructing the way to educational acquirements, are the despair and dread of their teachers who spend hours of time in nerve exhausting labor in the hopeless endeavor to maintain their grades, may be suddenly transformed by glasses, or other eye or ear treatment, from thickest density into intellectual brightness, thus relieving the teacher of at least one burden that sends her home at night in a condition of physical and nervous exhaustion. I am confident that if the eye, ear, nose and throat defects in any room in any school could be eliminated, the work of the teacher would be enormously lightened, and, if this is true, they should be willing, from purely selfish reasons alone, to say nothing of the benefits to be acquired by the pupils, to cheerfully and gladly see that these tests are annually executed.

Some critics fail to commend the results of the tests, because many parents disregard the school warning. This criticism seems rather puerile, and is equivalent to refusing a \$100,000 legacy because \$1,000,000 was not left to the beneficiary. Undoubtedly many parents through ignorance, impecuniosity, pride, neglect, etc., fail to seek medical advice for their children after cards of warning from the school authorities have been received, but on the other hand a large majority of the parents so warned unquestionably do as they are advised, and profit thereby. It has been also observed that most of the parents who primarily ignore the warning, from seeing the beneficial results upon their neighbors' children, or from the awakening of latent parental responsibility, or from some other cause, eventually seek medical advice, and become stout advocates of the plan. In any event, even if only a small minority of defective children are benefited by the tests they are certainly worth while, and the

tests should not be abandoned because all parents are not ready to receive them.

Some observers regard the tests lightly because they are frequently abandoned after having been used for one or two seasons. This is a most unjust criticism, and does not in any way argue against the usefulness of the plan, but does emphatically argue in favor of the inexcusable neglect and laxity of the school authorities. There can be no doubt of the enormous utility of the tests when properly and persistently applied, and yet it is but human nature to shirk all possible work, and as most teachers are already overworked, unless the school authorities annually urge, or *demand*, the execution of these tests, they may fall into general disuse or eventual abandonment. I wish them to earnestly plead with those in authority not to leave this matter to the option of individual teachers, but to *require* that the tests become a regular part of the school curriculum, and that they be *annually* performed at the commencement of each fall term. Many teachers object to the tests on account of the elaborate records and statistics suggested or required in some cities where the plan has been adopted. When I first proposed the tests I advocated rather elaborate statistical records, to be kept by the school teachers. Experience has, however, considerably dampened my ardor in this direction, and I now recommend the very simplest records or none at all. A multiplicity of records can scarcely aid us in deductions which are already trite, and from the examination of thousands of teachers' reports I can hardly recommend them as very valuable from a medical standpoint. To my mind they represent more useless work than actual value, and, while some records should possibly be retained, I would advocate that they be of the most elementary character, perhaps simply giving the names of the pupils, and whether a card of warning was given, and whether it was for an eye, ear, nose or throat defect. This brief report could be handed to the school principal, and then to the school superintendent, and would simply show that the tests had been made, which is really about all that is necessary. I wish to emphatically urge that the less elaborate the tests can be made in every way, the more surely will they be performed, and that there is no surer method of defeating the end in view than by elaborating and embellishing what should be a simple and uncomplicated affair.

Some observers have raised the objection that until the tests can be legally enforced by act of legislature, it is useless to advocate their adoption by school and health authorities, as they will not be performed except under compulsion. This argument seems almost an insult to intelligence and benevolence, and I am well convinced that when Boards of Health, Boards of Education, School Superintendents, School Principals and School Teachers once become convinced of the usefulness and necessity of the tests, and the ease with which they can be accomplished, legal authority will not be needed to enforce their adoption. Be that as it may, however, and admitting that legal enforcement by the state legislature, as has been accomplished in Connecticut, is the best method of securing the end in view (a statement which I am not at all prepared to accept), certainly there can be no better process by which to popularize the movement, than by first appealing to the intelligence of health and educational boards, school authorities and the people at large.

Some critics have objected to the tests on account of their expense. In the first place even if the expense was multiplied many times its actual amount, this objection should shame the objector when the enormous possibility for good, resident in the tests, is considered. Besides this the expense is so small that it should not for one moment be considered, as, even for a large city containing 5,000 school rooms, the expense need not exceed \$100 a year after the first year. Each school room should possess a testing chart, which will be subsequently described. When purchased in large quantities these charts, with teachers instructions attached, can be purchased for \$40 a thousand. A city with 5,000 school rooms can, therefore, be supplied with a chart for every room for \$200. After being used the charts can be carefully laid away, and preserved for future use, so that new charts will only be necessary once in several years.

The only other expense will be for the warning cards to be sent to parents, and the simple report blanks to be retained at school, which for even a large city could not exceed \$100 a year.

I have been at work on this movement ever since 1895, endeavoring to perfect and simplify the plan, and to secure its adoption in the various cities and states. Over 10,000 mailed communications of various kinds, including letters,

circulars, etc., have passed out of my office during that time. Much encouragement and, I am sorry to say, considerable opposition, chiefly of a professional nature, has been encountered; but the work has gone steadily on, and to-day the tests are quite generally used throughout the United States, and in some cities of Europe and Asia. At the last meeting of the American Medical Association, held in New Orleans, May, 1903, I secured the passage of the following resolutions, both by the Ophthalmological Section and the House of Delegates.

"Whereas, The value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures, therefore, be it

RESOLVED, That it is the sense of the American Medical Association that measures be taken by boards of health, boards of education and school authorities, and, where possible, legislation be secured, looking to the examination of the eyes and ears of all school children, that disease in its incipency may be discovered and corrected."

I sent a copy of this resolution to the president and secretary of every State Medical Society in the United States, and asked them to secure its adoption at their next meeting, believing that the favorable action of the American Medical Ass'n, and the various State Medical Societies, would be a strong argument to the different State Boards of Health and Education. Nearly every State Medical Society which has convened since the last meeting of the American Medical Association, has passed a resolution, and I am gratified to here enumerate them: South Dakota, Michigan, Montana, Delaware, Minnesota, Colorado and New York, the South Western Missouri Medical Association, and the Mississippi Valley Medical Association have also passed them, and I believe that practically all the other states will do likewise, as their annual meetings occur.

I have also communicated with every president and secretary of every State Board of Health and State Board of Education, in the United States; sent them the resolution; stated the necessity for the tests; handed them a question blank to be made out; and asked them to pass the resolution and set the plan in operation in their several states. I also sent them a circular, containing a description of the tests,

which has been for a year or more sent out by the Illinois Board of Health to all county superintendents of schools, requesting them to place the plan in operation in their various counties. I also sent them a circular issued by Mr. Almer Coe of 74 State St., Chicago, Ill., giving prices for the tests cards, with teachers' instructions attached.

As a result of these communications and inquiries, I found that while the tests were being quite generally used from one end of the country to the other, they were being systematically used only in Connecticut (under the State law) New York, (under the State Board of Health) and Illinois, where I had, a year or so ago, secured their adoption by the State Board of Health. Shortly after my communications had been distributed, however, the State Board of Education of Texas passed the resolution, and placed the tests in operation in that state.

I secured the adoption of these resolutions last October at the meetings of the State and Provincial Boards of Health of North America, and the American Public Health Association, feeling that as the membership of these societies is composed of members of the different health boards in the various states, that they would return home convinced of the usefulness and necessity for the plan, and secure definite action at their next state board meetings. Nor have I been disappointed, for in reply to another urgent appeal sent to the various State Boards of Health Officers, early in November, I have already received replies from Wisconsin, Minnesota, Indiana, South Dakota, Michigan, Florida, Kansas, Colorado and Ohio, telling me that at the next meeting of the Boards, the resolution will be adopted and the tests placed in operation, generally after the manner indicated by the Illinois circular. As soon as I have still further good news to report I shall again appeal to the various Boards of Education, telling them of the action of the Boards of Health throughout the Country, and urging them to unite with them in this most laudable undertaking. I shall again appeal to Boards of Health who have not adopted the plan, and also to the various State Medical Societies as they meet from time to time. In a word I am confident that at the next meeting of the American Medical Association, in June, I shall be able to report that the plan has been endorsed by almost every State Medical Society in this Country, and is in operation in

almost every State, under the supervision of the several Boards of Health and Education.

Having now gone over the subject as fully as seems desirable under the circumstances, and endeavored to answer most of the important objections to the tests that have been, from time to time, enumerated, I will now endeavor to describe the details of the tests and demonstrate the ease and facility with which they may be accomplished.

The chart which I recommend contains the ordinary test letters of Snellen, so constructed as to size as to be seen by a normal eye at certain definite distances. For instance the line marked 20 should be seen by a normal eye at twenty feet, producing vision which is designated by the fraction $20/20$. The line marked 100 should be seen by a normal eye at 100 feet, etc. Should, however, an eye be able only to read, let us say, the line marked 70 at twenty feet, the vision would be expressed by the fraction $20/70$, or if an eye should possess better than normal vision, and be able to read the line marked fifteen at twenty feet, the vision would be expressed by the fraction $20/15$. The distance between the child and the chart always constitutes the numerator of the fraction, while the smallest line which the child reads, constitutes the denominator. If even the largest number marked 200 cannot be seen at twenty feet, the vision may be expressed by ascertaining the distance at which fingers can be counted. It sometimes happens that fingers cannot be seen, and that vision is reduced to a mere perception of light, or even to total blindness. The reason for testing vision at twenty feet is simply because this is usually a convenient distance, and is the distance used the world over for this purpose; it is well, therefore, to adopt the customs already in vogue.

Below the testing letters of the chart will be found the teachers' instructions as to how the tests may be made, this portion of the chart being separated from the Snellen's test types by a half broken line through which the teacher should separate the upper from the lower card, the former of which should be hung on the wall when the tests are in progress, and the latter retained on her desk for guidance.

The card of instruction reads as follows:

Please detach by breaking on this line.

INSTRUCTIONS FOR THE EXAMINATION OF SCHOOL CHILDREN'S
EYES, EARS, ETC.

(After the method proposed by Dr. Frank Allport, of Chicago, Ill.)

For use of teachers, principals, etc.

Do not expose the card except when in use, as familiarity with its face, leads children to learn the letters "by heart."

First grade children need not be examined.

The examination should be made privately and singly.

Children already wearing glasses should be tested with such glasses properly adjusted on the face.

Place a card of Snellen's test types on the wall in a good light; do not allow the face of the card to be covered with glass.

The line marked XX (20) should be seen at twenty feet; therefore place the pupil twenty feet from the card.

Each eye should be examined separately.

Hold a card over one eye while the other is being examined. Do not press upon the covered eye, as the pressure might induce an incorrect examination.

Have the pupil begin at the top of the tests card and read aloud down as far as he can, first with one eye and then with the other.

Facts to be ascertained.

1. Does the pupil habitually suffer from inflamed lids or eyes?
2. Does the pupil fail to read a majority of the letters in the number XX (20) line of the Snellen's test types, with either eye?
3. Do the eyes and head habitually grow weary and painful after study?
4. Is the pupil probably "cross-eyed."
5. Does the pupil complain of ear-ache in either ear?
6. Does matter (pus) or a foul odor proceed from either ear?
7. Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room? Each ear should be tested by having

the pupil hold his hand over first one ear, and then the other. The pupil should close his eyes during the test.

8. Is the pupil frequently subject to "colds in the head?" and discharges from the nose and throat?

9. Is the pupil an habitual "mouth breather?"

If an affirmative answer is found to any of these questions, the pupil should be given a card of warning to be handed to the parent, which should read something like this:

Card of Warning to Parents.

After due consideration, it is believed that your child has some eye, ear, nose and throat disease, for which your family physician or some specialist should be at once consulted. It is earnestly requested that this matter be not neglected.

Respectfully,

School.

If only an eye disease is suspected, the words "ear nose and throat" should be crossed off, if only an ear disease is suspected, the words "eye, nose and throat" should be crossed off, if only an "nose and throat" disease is suspected, the words "eye and ear" should be crossed off.

It will be observed that these cards are non-obligatory in their nature. They do not require anything of the parent, who is at perfect liberty to take notice of the warning card or not, as he sees fit. They simply warn the parent that a probable disease exists, thus placing the responsibility upon the parent.

Nevertheless if parents neglect the warning thus conveyed, the teacher should, from time to time, endeavor to convince such parents of the advisability of medical counsel. Teachers are urged to impress upon pupils and parents the necessity for consulting reputable physicians.

These tests should be made annually at the beginning of the fall term, and should include all children above the first grade.

Each teacher should examine all the children in his or her room, and should report the results of such examinations to the principals.

The following simple form of report to be filled out by the teacher and handed to the principal is suggested,

No.	The name of the pupil.	Do the tests indicate an eye, ear, nose, or throat disease? Answer "Yes" or "No." If so, which?	Was the pupil given a card of warning?

CATARACT—AN HISTORICAL REVIEW OF ITS SURGICAL TREATMENT.

BY SAMUEL HORTON BROWN, M. D.,

PHILADELPHIA.

During recent years considerable has been written concerning this subject but careful inquiry has shown the omission of many very important facts in all of these papers. The best historical account is given by Magnus¹ but even this fails to give proper credit to the English and American students of Ophthalmology, whose ingenuity has aided greatly in the perfection of cataract operations. De Wecker² and Von Graefe³ have likewise given somewhat biased reviews but are well worthy of careful perusal. Alvin Hubbel⁴ in an address commemorative of the third semi-centennial anniversary of the first publication of Daviel's extraction operation related the life of this distinguished surgeon and a detailed description of his operation, and thereby added much interesting data to the subject. Much of the material in the following article will necessarily be similar to that contained in the accounts just mentioned, but it has been gleaned from separate sources so that the plagiarism thereof is only apparent, not real.

The term cataract is Arabian in origin and the condition is so named on account of the resemblance, the cloudiness of vision induced by it bears, to the mist produced by the ordinary waterfall or cataract in nature. The term was first applied to describe lenticular opacities by Matteus Platearius of Salernum in 1150.⁵ The association of the crystalline lens with cataract was unknown, according to all accounts, until the beginning of the 17th Century, in fact the true function of the lens was not fully understood before this period. Celsus⁶ and Galen (1679) believed the crystalline lens to be the essential and immediate organ of sight. It is stated that Hippocrates, Galen, and Oribazes were aware of the true situation of cataract, but the view that cataract was due to a condensation of the most viscid portions of the aqueous humor and crystalline lens prevailed for two or

three centuries. Ambroise Paré (1579) believed it to be due to the formation of a pellicle in the posterior chamber in front of the lens, and a somewhat similar opinion was held by Woolhouse as late as 1720. Ambroise Paré⁷ states that "cataract is nothing but a concretion of a humor into a certain thin skin under the horny coat just against the apple or pupil and, as it were, swimming upon the watery humor, whereas the place ought to be empty." His observations of this condition are extremely interesting. In his writings he distinguishes between ripe and unripe cataract and mentions the fact that patients are duller sighted at noon and surer sighted in the morning. A preventive treatment is given by him in the failure of which he admonishes the surgeon to wait until the cataract is ripe before proceeding to an operation, and to determine its maturity he gives the following rule:

"If the sound eye is shut, the pupil of the sore or suffused eye after it shall be rubbed with the thumb, be presently dilated and diffused, and with like celerity return to its figure, color, and state it is thought by some to show a ripe and confirmed cataract. The opposite condition constitutes unripe cataract. Incurable cataracts are those in which there is no change in the pupil and are due to obstruction of the spirits in the optic nerve." While somewhat distorted, this quotation shows that this surgeon understood the importance of the pupillary reflex and its relation to pathologic changes in the retina and optic nerve when associated with cataract.

That cataract and glaucoma were at one time looked upon as varieties of the same disease may perhaps be new to some of those who may glance over this paper. Paulus Aegineta states that glaucoma and suffusion were considered by many of the ancients as the same disease but in his day glaucoma was recognized as an incurable affection of the crystalline humor which is changed by a watery substance into a cerulean humor but suffusion is reckoned as a defluxion of humors concreted between the cornea and crystalline lens. This belief was likewise maintained by Oribazes. Aëtius in stating this same theory says that there are two kinds of glaucoma, one in which the name is applied when there is dryness and concretion of the crystalline humor which is changed to sea-green (glaucom) color and one from suffusion,

the humor near the pupil having become congealed and dry. Leo also accepted these confusing theories and describes senile cataract under the term glaucoma. Haly Albas, it is said, knew the disease (cataract) was located in the lens but acknowledged that this was not always the case.

Keppler in 1604 and Plempius somewhat later showed that normally the lens was transparent and therefore not the seat of vision as had been supposed prior to this period. Maitre-Jan in 1692⁸ announced his discovery that the crystalline lens itself was the seat of cataract and aroused much discussion thereby, before the Royal Academy of Science (Paris) receiving only the support of Antoine. Lapeyronie and Morand accepted the discovery shortly afterward and later proved its truth by exhibiting before the same society eyes with opaque lenses and capsules. Lasnier and Quarre are said to have made the same discovery some time previous. At a still later period the observations of Brisseau (1706), Woolhouse, Rolfink, Goeffroy, Muralt, Petit, Bonnet, Mery, Chapuzean, Rolfucius (1656), Rohault, Marriotte (1668), Gassendi (1660) and others aided in its confirmation and general acceptance.

Dionis in 1707⁹ wrote that cataract was a foreign substance which is amassed and thickened imperceptibly into a small pellicle between the cornea and the crystalline lens in the aqueous humor in front of the opening of the uvea. Brisseau (*Traite de la Cataracte du Glaucoma*, Tournay 1706) added to the nomenclature of the eye, the term chamber and applied it to the space in which the aqueous is contained.

The distinction between membranous and crystalline lens opacities was first pointed out by St. Yves in 1707, but he considered the latter as deposits of a purulent nature.

With the general acknowledgement of the situation of cataract in the lens, the condition of capsular cataract was entirely overlooked and it remained for Ph. de la Hire, Freytag, and Morgagni to demonstrate that cataract may be due to an opacity of the capsular membrane. That cataract was due to an opacity of the lens, its capsule, or the matter in which it floats was shown by S. Muralt, Didier, Heister, and Chapuzean. Malgaigne in 1841 attempted to show that there was no such condition as capsular cataract and that the secondary cataracts so-called, were due to remnants of cor-

tical matter that had become opaque by the action of the aqueous. This was demonstrated to be but partly true by Arlt in 1855, who proved conclusively the occurrence of true capsular cataract.

That cataract depended to a large extent upon nutritional disturbance was shown by Heister, who thought that it was due to obliteration of the vessels of the lens. Delpech accepted the importance of nutritional disturbances in this connection but believed the local change to be one of necrosis. Guilleman (1610) and Avicenna held the opinion that the maturity of cataract was affected only by age and that its consistency was greater as it became older. The influence of heredity in its production was shown by the writings of Carron du Villards, Deshayes, Geudron, Janin, Maitre-Jan, Petit, Richter, Sanson, Wardrop, Maunoir, Argentan, Magne, and others.

Exposures to high degrees of heat has been reported as a cause of cataract within recent years but a similar observation was made by Wathen in 1785¹⁰ who wrote that blacksmiths and all mechanics who work near large fires, were more subject to cataracts than other persons, and mentions two cases in which the patients were instantly seized at the very time they were employed. The reports of cases of very sudden onset and course are encountered frequently in the older writings, Richter ¹¹ for instance, relates an instance in which cataract formed in the course of one night in a gouty patient after undue exposure of the feet to an extreme degree of cold, and later Martin of Portlaw ¹² describes two cases in which lenticular cataract developed over night.

The imperfect knowledge of cataract up to the latter part of the 18th Century, was undoubtedly due to the lack of facilities for examination and the consequent distinction of lenticular opacities from simulating conditions. Purkinjie in 1823 described the phenomena of the three candle images during accommodation and the principle of this test was utilized by Sanson in 1836 to determine the presence of cataract.

Mackenzie suggested the use of the double convex lens and oblique illumination as a means of detecting cataract, but it is more than likely this test was employed by other ophthalmologists before him. With the discovery of the ophthalmoscope by Helmholtz ¹³ and its subsequent modifica-

tions by Coccius¹⁴ and Follin¹⁵ the exploration of the pupillary area and interior of the eyeball became comparatively easy and the diagnosis of cataract was rendered less difficult than formerly.

Previous to this period there were but two varieties of the condition recognized, white and black. The latter was very rarely observed. Janin¹⁶ was the first to accurately describe it. Pellier, Wenzel, Graefe (senior), Lusardi, Guy du Chauliac, Morgagni, Rolfink, Wenzel, and others, subsequently recorded cases of this kind but Dupuytren and other surgeons of large experience of his period had never observed the condition. The ophthalmoscope and oblique illumination served to render the diagnosis of these cases and other previously unrecognized forms of the condition possible.

Preventive treatment of cataract attracted the attention of the ancients and such measures as division of the vessels of the forehead and temple, and incising through all the structures to the bone were often recommended. It was a common practice to keep open these wounds by packing or the actual cautery. The Chinese and Japanese are reputed to have tried acupuncture following by actual cautery with a view of preventing the affection.

Methods for the ripening of immature cataracts have been devised from time to time and deserve passing mention. Simple division of the anterior capsule is perhaps the oldest. Mooren advised the combination of division with iridectomy while Rohmer divided the capsule and followed this procedure by massage of the cornea and globe. Förster performed iridectomy after which he subjected the lens to trituration through the cornea. Lasso, Ricaldi, Bethman, and others have tapped the anterior chamber and applied massage directly to the anterior capsule, while White merely performed paracentesis and external massage. Extraction of immature cataracts was proposed by Stevenson¹⁷ in 1820 but was soon found faulty and discarded.

Couching.—The depression of the lens into the vitreous was, perhaps, the oldest operation performed for this condition. It was invented by Celsus¹⁸ who performed it by means of a needle, and in his description of the operation warns against attempting to perform it upon immature cataracts. He refers to the physicians of Alexandria, especially a certain Phyloxenes, who were particularly skillful in this

operation. The instrument recommended by Celsus was spear-shaped, straight, and two inches long. This was superseded at a subsequent period by a round needle.

Galen¹⁹ has alluded to it but gives no account of it. Paulus is the only Greek author who does not give at least passing mention of the operation or its technique. Sextus Platonius²⁰ mentions that in cataract the diseased structure is sometimes depressed by a specillum, an instrument resembling a probe. Mesne²¹ and Paulus Aegineta²² also describe the procedure at length. Albucasis²³ gives an account of couching and in the event of failure, recommends sucking the cataract through a glass tube. Avenzoar was an advocate of depression but mentions tearing the lens (*broiement*) to pieces if it is unsuccessful; this alternative was also advised by Celsus.

Avicenna²⁴ in his description of couching, mentions that some surgeons in addition, open the lower part of the cornea and extract the opaque lens. This is one of the earliest authentic references to the operation of cataract extraction. Rhases practiced couching and has given an account of this operation and that of extraction.

Carron du Villards traces descriptions of couching among the most ancient traditions of Hindustan and the Chinese Empire. The operation was likewise performed by the early Egyptians. That it takes its origin in remote antiquity has been shown by Petit, who states that it was in vogue in Egypt during the reigns of Ptolemy-Soter, and Ptolemy-Philadelphus, with whom Herophilus and Erasistratus were contemporaries. Galen in his allusion to the operation asserts that there were oculists in Rome and Alexandria who performed this operation exclusively.

After a period of great popularity, the operation was discarded for a while and fell into the hands of wandering physicians and charlatans. There is no evidence to show that it was substituted by any other operation during this period. In 1604 with Kepler's announcement that the lens was not the seat of vision, renewed interest was taken in the subject and from that time on, somewhat similar treatments with modified instruments were constantly being devised. Wilburg²⁵ in 1785 revived couching as an original operation, depressing the lens backward and to the outer side of the ual axis. The success of this operation prompted its per-

formance by Schmidt, Dupuytren, Scarpa, and other surgeons of this period. Within comparatively recent years it was again brought forward as a commendable procedure by M. Lucien Boyer²⁶ in 1848.

In the early operations, the single needle was employed almost entirely, the modification of which, however, were legion. The needle of Celsus has already been described. Scarpa's couching needle was 18 lines in length and terminated by a point slightly widened, curved into the shape of an arc, flat on its convexity, and cut into a ridge on its concavity. Dupuytren rejected the crest of this needle and made the corresponding side more flat than the back in order to more accurately embrace the lens and prevent its division during the depression. The breadth was less than that of Scarpa's needle, and its body slightly conical so as to fill up the track traced by the point. The needle of M. Bretonneau was shorter, but of the same breadth, as Scarpa's instrument. Its shape was almost cylindrical and melted steel was used in its manufacture. Beer's needle was straight and had a conical shape; its point resembling somewhat that of a spear. Hey proposed a needle, the length of which was 10 to 12 lines and in appearance was not unlike a chisel. Hilmer's needle was conical; its free extremity was flattened and terminated in a half moon, the edges of which were straight and rounded. Guerbois²⁷ designed a needle with a double rest on its concavity. The instrument used by Bergeon was two lines in length and hollowed out in the form of a spoon, and that devised by Charriere was so arranged that after being introduced into the eye it opened itself in the manner of the lithotome of F. Come. These modifications are but a few of the many proposed in the latter part of the 18th and early decades of the 19th Centuries and we find the names of Graefe, Langenbeck, Himly, Schmidt, Spitzae, Middlemore, and others associated with separate forms, each possessing an advantage peculiar to itself. To an unbiased observer it would appear that the modification necessary in each case was commensurate with the lack of mechanical skill and adaptability of the individual operator but, however that may be, the modification habit has still remained in vogue.

The Chinese²⁸ are said to have used in couching, a gold needle, one inch in length, round and tapering in shape

which when not in use was protected by a goose-quill covering. In irrigating the eye, the surgeon dips his hand into water and holds it over the eye allowing the water to drip over that organ.

Breton²⁹ before the Med. and Phys. Soc. of Calcutta, Feb. 5th, 1826, described an operation entirely different from those previously given which had been in use for an indefinite period by the natives of Hindustan, both Mohammedans and Hindus. It differs from the Arabian and Grecian operation in that two instruments, a lancet and a needle, are used. The lancet is used to perforate the eye and is prevented from entering too far by a thread tied around it 1/10 inch from the point. The needle is then passed through the opening and pressure is made on the lens downward and backward into the vitreous. The needle resembles a probe somewhat and is about 5 inches in length. It tapers as the end is reached, at which it is 3-sided, with the edges and point blunt. The thread is also tied around it to prevent its entering too far into the eye.

The technique of couching is known by a number of terms, each indicating the manner in which the needle is manipulated. *Scleroticonyx* is employed to signify the operation in which the needle is entered through the sclera between the uvea and vitreous humor and *keratonyxis* is used when the needle is made to enter the eye through the cornea. *Scleroticonyx* is said to have been performed by the Arabs and descriptions of it have been given by Conradi, Beer, Buchthorn, Langenbeck, and more recent surgeons.

The technique of the ordinary operation of scleroticonoxis is best described by Velpeau³⁰ from whom I take the liberty of quoting the following: "With the forefinger corresponding to the diseased side, the operator depresses the lower lid and fixes the eye. With the other hand he seizes the needle in the manner of a writing pen, directs its point perpendicularly upon the sclerotica, at one or two lines from the transparent cornea, a little below its transverse diameter; turns its concavity downward, one of the cutting edges toward the cornea and the other toward the orbit in order that he may penetrate, rather by separating apart, than by dividing through the fibers of the coats of the eye; first inclines the handle of the instrument with considerable force downward, then raises it gradually in an opposite direction in proportion as

he enters into the posterior chamber, and makes use of his last two fingers in order to procure a *point d'appui* between the parotid and the cheek bone. *Second Stage*—Before plunging it in further, he turns the instrument on its axis, in order that its concavity may face backward and that he may be enabled to pass without danger below, then in front of the crystalline, while penetrating from without inward and slightly from behind forward without touching the iris or lenticular capsule, if he possibly can, as far as into the pupil and anterior chamber. He then passes its point circularly several times around the anterior circumference of the lenticular body, the envelope of which is in this manner lacerated as completely as possible. *Third Stage*—This being accomplished, the surgeon applies the arc of the needle directly upon the front part of the cataract, which he then draws by an oscillating movement downward, outward and backward into the bottom of the eye, below the pupil and the vitreous humor, where he holds it fixed for the space of a minute in order that it may not become disengaged. *Fourth Stage*.—The instrument is then drawn backward without shaking it, by small movements of rotation; it is brought back to the horizontal position; we again turn its convexity upward, and remove it from the eye, by making it pass through the same track it had taken in entering.

Petit, believing that the seat of cataract was always in the lens itself devised a modification of this operation which consisted in depressing the opaque lens without rupturing the anterior capsule. It was thought that by retaining the membrane the necessity of wearing convex lenses subsequently would be obviated. The frequent occurrence of secondary cataract, however, demonstrated its great disadvantage. The operation was revived by Ferrein some years later. Bretonneau performed an operation in which after having made a passage in the vitreous, proceeded to rupture the anterior capsule.

The term *hyalonyxis* was applied to those operations in which the needle was introduced through the sclera and a track made in the vitreous for the reception of the lens subsequent to its displacement. Such a procedure was spoken of by Celsus³¹ as supplementary to displacement when the latter is impracticable. Barbette³² likewise performed it and Read³³ in 1706 described the operation and its terminations in detail.

Bowen³⁴, a traveling oculist, modified the operation of hyalonyxis by entering the needle through the sclera four lines from the cornea. The vitreous is traversed and the posterior capsule is ruptured leaving the anterior capsule intact. Bowen claimed the operation as original with him and reported most wonderful success from its employment.

Reute³⁵ caused his needle to enter at the side of the capsule on a line with the pupil; it was then turned forward in order to rupture the capsule after which the lens was depressed in the usual manner. Goyrand introduced the needle through the sclera and made a circular sweep upon the whole lens which he transfixed and depressed without giving any attention to the anterior capsule. Bell, Giorgi, Gensoul, and subsequently, Roux, made a small incision at the sclero-corneal junction behind the iris after which a sort of scoop was introduced through the opening and the lens depressed.

Reclination was the term applied to an operation in which the position of the lens was changed by a small needle passed through the sclera so that the upper edge of the lens is placed posteriorly and the lower edge is situated anteriorly. This procedure induced suppuration and subsequent absorption of the lens. This method of treatment was advocated by Welburg,³⁶ Pott and Schifferli.

Discission or breaking up of the lens by means of a needle was performed by early ophthalmic surgeons as a substitute for couching in its various forms. Maitre Jan in 1711 made the observation that absorption of the disintegrated lens occurred in the anterior as well as the posterior chamber (cavity of the vitreous). Pott in 1775, in a separate article on cataract, and later in 1808, in his surgical works, coined the term dissolution for this operation, and adopted laceration of the capsule as a separate method of treatment. Ware performed a similar operation and Warner showed that the reduction of the lens to fragments was followed by absorption and cure. Saunders in 1804, perfected the operation of discission and is generally accredited with having devised it. According to Abernethy³⁷ he was preceded by Hey of Leeds, who entered his needle through the sclera. The ease with which it could be performed, led surgeons like Cappuri, Adams, and Parmi, to employ it in all cases. The operation was performed from posterior as well as the anterior surface of the lens. Lowen-

hardt³⁸ effected destruction of a cataract and subsequent cure, by passing a seton through the lens.

Keratonyxis, the operation of couching, in which the needle entered through the cornea is said by some observers to be of comparatively recent origin, but Avicenna relates of physicians who opened the cornea and depressed the lens by a needle termed *al-mokadachet*, and Abul-Kasem states that he performed this operation. According to Herbeer it was in practice in Egypt since most remote periods and Souty makes the same statement as regards India. The operation is mentioned in the writings of Haller and Galen. It was revived in the 18th Century by Smith, who employed the process of the Arabians. It was subsequently performed by Dudell, Taylor and Richter. It was introduced into France by Gleize and into Germany by Conradi about 1786. It was performed by Beer in 1785 and by Demours in 1803 and the name it bears was coined by Reil.

Various modifications of this operation were suggested by the surgeons of this period. Most of these consisted in changes in instruments and variations in the situation of the point of entrance. To enumerate all of this would be a gigantic undertaking so that I shall content myself to mention that of Pauli³⁹ who penetrated the cornea and then divided the vitreous humor above the lens in order to perforate through this opening the entire lens; and the method of Quadri⁴⁰ who introduced a forceps-needle through the cornea in order to extract the capsule while the lens was being depressed by means of an ordinary needle passed through the sclera. Tehoc and subsequently Wernecke, punctured the cornea and allowed the aqueous humor to drain off in order to promote the absorption of the cataract.

That couching was still in vogue up to the middle of the last Century is shown by Hugh Neill,⁴¹ Lawrence⁴² and Mackenzie⁴³ who describe it at great length and recommend its performance in selected cases. From this period, however, it was gradually supplanted by the operation of extraction in its various forms.

Extraction.—Probably the first step in the evolution of this operation consisted in the extracting of the lens substance through a hollow needle introduced into the eye.

There is abundant evidence to show that this method was employed by the illuminati of Persia, Abul-Kasem, Albuca-

sis, Rhazes, Guy de Chauliac, and other ancient ophthalmic surgeons. Abul-Kasem learned the operation from an inhabitant of Irack in which country it was practiced extensively. Rhases is the authority for the statement that Antyllus and Lathyrion extracted opaque lenses in the first century by opening the cornea by means of a needle. Avicenna states that Hali Abbas surnamed "The wise" also performed extraction of the lens for the cure of cataract. A similar assertion is made in Sprengel's History of Medicine quoting from Hali Abbas.⁴⁴ Avicenna likewise mentions the extraction of a cataractous lens through an incision in the lower portion of the cornea. It is said that Galen incised the cornea and extracted the lens through this incision. Avanzoar and Isa Ebni-Ali while they did not accept the procedure as of any value, stated that it was in common use in Persia. It was revived by Galeatius who claimed it as original with him. Albinus in 1695 likewise performed the operation but employed it only for membranous cataracts.

The operation was for a time discarded but made its reappearance in 1694 when it was revived by Johann Conrad Freytag in Zurich.⁴⁵ He opened the cornea by a small incision and extracted the lens by means of a hooked needle provided with an additional fine hook. He performed the operation but three times in all and in each it was employed after unsuccessful reclination or depression. Freytag however, never removed a complete lens by this method but only thickened capsules and adherent remnants of lenses.

Woolhouse is said to have extracted capsular cataract by means of a forceps needle but Blancard of Amsterdam, is accredited with being the first to teach extraction of the entire lens through a corneal incision. He advised incising the cornea in its upper portion after which the lens is withdrawn by the aid of two needles fashioned like forceps.⁴⁶

The first case in which a complete extraction was performed came under the care of Charles de St. Yves in 1707.⁴⁷ In this instance the lens had been spontaneously prolapsed into the anterior chamber. The incision in the cornea was situated a little below the pupil and the lens was removed through it with the aid of a curette.

St. Yves⁴⁸ performed the operation again in 1716 on an opaque prolapsed lens directly traceable to traumatism at some remote period. Later he reported these cases at great

length and described the operation in its various details. In 1708 Pourfour du Petit performed a similar operation as that of St. Yves in 1707 on a patient who had been subjected to reclinatio a few years previous without success. The lens had become dislocated into the anterior chamber during violent muscular effort. Mery in the Academie Royale des Sciences, 1708, gave a detailed account of Petit's operation and stated that he first passed a grooved probe transversely into the cornea after which a lancet was run along the groove of the instrument and the incision completed. Taylor in 1735 performed a somewhat similar operation for the same condition. Until this period extraction through a corneal incision had been confined to lenses luxated in the anterior chamber and it was Mery who suggested extraction of cataracts situated behind the pupil,

Lotterius of Turin has been mentioned as among the first to perform a complete extraction but the credit of perfecting the operation belongs entirely to Jean Jacques Daviel; according to his biographer d'Apples of Tousanne, his first operation for cataract, performed about 1730 was that of ordinary depression. He attributed the bad results following his subsequent operations of this character to the sharp-edged and sharp-pointed needles in common use at this time. With a view to obviating these difficulties he devised blunt-pointed instruments and a new method of operating which consisted in making an incision near the lower margin of the cornea with a small bistoury, enlarging the opening with scissors after which he passed a blunt needle through this opening and depressed the lens in the usual manner. This operation was performed in 1745. In 1747, after an unsuccessful attempt to depress the lens he held the corneal flap by a small forceps in order to widen the wound and brought out the lens and a small portion of the vitreous through it. A short time later he encountered a case of cataract in which he incised the cornea with a small knife after which he enlarged the wound by means of small curved scissors and introduced a spatula to the upper border of the lens, detaching it and extracting it in fragments. In 1750 he had perfected the operation to his own satisfaction and thereafter he employed it exclusively. He communicated his observations to the Royal Academy of Surgery of Paris in 1752 but his views were not published until 1753.⁴⁹

The operation performed at this period by Daviel consisted in incising the cornea at its inferior sclero-corneal junction with a triangular-shaped knife. This incision was enlarged on both sides as far as possible by means of a narrow, blunt-pointed, double-edged knife and completed with delicate curved scissors until the ends of the incision were situated a little above the pupil. The corneal flap was then elevated by means of a small spatula and the anterior capsule of the lens was lacerated by a sharp-edged needle. After extracting the lens and adjusting the edges of the corneal wound, the eye was covered with compresses held in place by plasters and a bandage. He did not consider the escape of vitreous as an occurrence of great seriousness. In the later years of his practice he performed iridectomy in the course of the operation. He modified his flap somewhat, making it shorter than in the earlier operations and in a few cases caused it to be triangular. He rejected forceps, hooks and other apparatus for fixing the eye, preferring to have it free during the entire procedure. He devised the curette which he used in soft cataracts and which bears his name at the present day.

The corneal flap operation as performed by Daviel was eventually accepted by most of the surgeons of this period but it remained for George Friederich Siegwart, professor of surgery in Tubingen,⁵⁰ to point out its principal defects. His incision was more straight than that of Daviel and was made up of 3 linear incisions; a short central incision made with a lancet and two lateral extensions which are made by means of straight scissors passed along the groove of a previously introduced grooved probe.

One of the first linear extraction operations was performed by Palucci⁵¹ in the middle of the 18th Century, although similar procedures are accredited to Gibson and von Jaeger (elder). He applied his operation to capsular cataracts as well as prolapsed opaque lens. For making his corneal incision he employed an instrument the point of which resembled a needle which expanded into a knife blade. The object of this was to more easily fix the eye during the corneal section and thus dispense with the scissors commonly employed at this period. He professed to having performed the operation which bears Daviel's name, in 1752. While his operation represents the first step in the evolution of the

operation of linear extraction, it did not entirely dispense with the corneal flap as his incision was curved.

La Faye⁵² of Paris, in 1752, was the first to make the opening in the cornea by one incision and he suggested the employment of a single knife for the purpose. He devised a narrow bladed knife and a cystotome resembling a triangular lance. Poyet in 1753,⁵³ devised a knife with an eye near its point to carry a thread which when introduced was used to steady the eye while the incision downward was completed. To Samuel Sharp⁵⁴ belongs the credit of the single corneal incision. His original operation consisted in compressing the inferior portion of the globe gently with the thumb so as to expel the lens through the corneal incision, but later he modified it by thrusting the knife directly into the lens as soon as it prolapsed into the anterior chamber and extracting it. By this procedure he believed cutting of the capsule would be rendered unnecessary.

Other contemporaries of Daviel, such as Warner 1754, Beranger 1756, Tenon 1757, and Pamard 1759, devised narrow bladed knives for the performance of the operation as suggested by Sharp. Sigerist modified Palucci's knife by increasing its length in order to open the capsule through the anterior chamber but Jung used the ordinary cataract needle for this purpose.

As the difficulties attendant upon opening the eye through the cornea increased in number, it was suggested to make the incision through the sclerotic. One of the first to advocate this procedure was Butler in an article published in 1783 in which he stated, however, that he had performed the operation only upon the cadaver. This was likewise proposed by O'Halloran⁵⁵ who employed a double-edged knife at a distance of one-third of a line from the cornea, and Benjamin Bell⁵⁶ who entered the knife in the sclerotic one-tenth of an inch behind the corneal margin. This operation was subsequently performed by Sir James Earle of London in 1801, and Quadri of Naples in 1827. M. Pirondo employed the operation in France.

Returning to the modifications of the corneal incisions, which were extremely numerous at this period, the first to attract the attention is that of Pamard, who in 1784 made the incision in the upper portion of the cornea. Two years later Wenzel⁵⁷ in France reported his modification of Daviel's

operation in which the incision in the cornea was made obliquely from top to bottom and from outside to inside cutting the cornea and capsule at the same time. He entered the knife 45° above the horizontal diameter of the cornea and brought it out below the equator on the nasal side. Baron Wenzel was among the first if not the first, to employ a broad knife in this operation and his description of the instrument devised by himself in 1762, may be quoted as follows: "It resembles a common lancet employed in bleeding except that its blade is a little longer and not so broad. Its edges are straight and if it has sometimes the appearance of convexity it is faulty. The blade is an inch and a half long and a quarter of an inch wide at its base, the broadest portion. From thence it gradually becomes narrower toward the point; so that this breadth of a quarter of an inch extends only for the space of about $\frac{1}{3}$ inch from the base and for the space of $\frac{1}{2}$ inch from the point it is no more than $\frac{1}{8}$ inch broad. The lower edge is sharp throughout its entire length. At the distance of $\frac{1}{4}$ inch from the base the lower edge has a slight projection. The upper edge is divided into three portions. For a space of $\frac{5}{6}$ inch from the base, the edge is blunt and slightly flattened, for a space of $\frac{1}{2}$ inch further toward the point it is blunt and rounded, and for a distance of $\frac{1}{8}$ inch from the point it is keen like its lower edge. M. Richter of Göttingen claimed to have independently devised and used a similar instrument in 1770.

The observations and teachings of Wenzel on the entire subject of cataract are filled with interest to the careful student of Ophthalmology. In the preparation for the operation of extraction he restricted the patient to a vegetable diet and in the after-treatment, allowed on the first and second days, weak broths, barley water, veal tea, chicken broth, whey, and lemonade. On the third day, in the absence of pain, light meats and stronger broths were permitted. He recommended and performed iridectomy to prevent retention of the iris in the edges of the corneal wound. This had been performed by Daviel in complicated cases but not as a routine procedure. Follin ascribes the early iridectomy in connection with cataract operations to Shuft, who performed it immediately before the operation and to Mooren who made use of it two weeks previously. As regards fluidity of the vitreous and its subsequent loss

in the extraction operations, Wenzel states that he had often witnessed it without any deleterious results. The systematic use of high convex lenses after the removal of the lens may doubtless be accredited to this observer. In Daviel's cases it has been mentioned that the patients were able to read with the aid of a magnifying glass, but Wenzel in 1769, experimented with the lenses to determine the necessary strength or in other words measured the refraction. That he fully understood the condition of astigmatism following section of the cornea, is shown by his description:—"There are instances in which a slight depravity of sight takes place after the operation as when objects appear double, which is sometimes the case, or, as at other times they are seen under a shape somewhat different from that which they really exhibit. Bodies, for example, that are round, appear to patients of this description of a long or elliptical form. But this incorrect vision goes off by degrees and commonly in a month or six weeks after the operation no imperfection remains." Strange as it may seem this observation attracted no attention and the effect of alterations in corneal curvature on vision remained in obscurity until the discovery of astigmatism by Thomas Young in 1793.⁵⁸

About this period discussion was rife in the ophthalmic world (as at present) as to the propriety of operating by the new method on bilateral cataracts at the same sitting. Arranged in favor of this proceeding were Wenzel, Boyer, Graefe (Senior), Jaeger, Rosas, Forlenz, Fabini, and Qaudri, while opposed to it were Demours, Dupuytren, Scarpa, Marc Antony, Carron du Villards, Rossi, Samuel Cooper, Maunoir, and Travers, who preferred waiting until one eye had been successfully operated upon before touching the other.

Wenzel's method of operating was soon found faulty and he replaced it by the upward corneal incision devised by Santarelli⁵⁹ in 1795. He introduced a double-edged knife or broad lancet directly into the anterior chamber from the middle of the superior border of the cornea forming his incision by pressing the instrument downward. The upper corneal incision was subsequently accepted by Benjamin Bell and Jaeger.

Among the new departures of the latter half of the 18th Century was the operation proposed in 1795, by Barth, the

founder of the Vienna School of Ophthalmology, in which a triangular blade was introduced at the lateral margin of the cornea in order to make the upward flap. It was not associated with his name but with that of his successor Beer, a prototype of whose instrument we have in the ordinary Beer's knife in use at the present time. Beer in 1799⁶⁰ rejected the operation in which the capsule is first lacerated and preferred to extract the lens and capsule together. Prochaska, Schmidt, and Santarelli were contemporaries of Beer, all of whom had pupils under Barth. Beer's first essay as regards his cataract operation was published in 1791. His reputation as a teacher became wide-spread and he numbered among his pupils, Jaeger, Wardrop, Rosas, Benedict, Bringolf, and Fisher. F. Jaeger took his degree in 1808 and not long afterward devised a knife which consisted of two blades, a large one alongside of which was concealed a smaller one. The smaller blade was used to penetrate the cornea and fix the eye as there was much tendency toward rotation. If the eye was quiet the larger blade was used to complete the operation but if not, the small blade was employed to complete the corneal wound and open the lens capsule. He and Edward Jaeger coined the term "linear extraction" and the former is considered in Germany as the originator of the operation.

Wardrop (1808) believing that the close proximity of the incision to the corneal margin was responsible for many of its complications suggested that leaving a broad margin by means of an angular flap incision would prevent prolapse of the iris into the wound. This resembled in many of its features the operation of Siegwart.

The operation with which Gibson's (1811) name is so closely associated was that in which the fragments of capsular cataracts were evacuated through a corneal puncture, three lines in breadth after having first broken up the lens with a couching needle.

Travers in 1814⁶² working independently of Gibson, evacuated the softer forms of cataract through a small corneal incision. In the more mature forms he first passed a couching needle into the posterior chamber, lacerated the capsule, and pushed the lens into the anterior chamber after which he extracted it through a small linear incision. Later, he omitted the preliminary needling.

Stevenson in 1820⁶³ proposed the extraction of immature cataracts as a routine procedure but this was soon found to be faulty and was abandoned.

Jaeger⁶⁴ in 1827 revived and perfected the operation by the lower incision.

Linear extraction was not destined to receive much attention and was soon forgotten entirely. As late as 1850 it was unheard of, the operations at this time being discussion for soft cataracts in young people and flap extraction or couching for the hard opaque lenses. The operation of linear extraction combined with iridectomy, which we have come to know as Graefe's operation, was performed within a few years afterward. This operation to all intents and purposes is practically the operation of to-day but countless modifications have been brought forward from time to time. In it the puncture and counter puncture are made in the sclera, one millimeter from the cornea and on a line two millimeters below the upper corneal margin. Iridectomy was performed before the lens was extracted.

Among the principal modifications may be mentioned those of Steffen, De Wecker, Lebrun, Liebreich, Weber and Suellen. Steff in began his incision at the upper third of the cornea at the limbus and performed iridectomy in addition. De Wecker entered his knife through the sclerotic one millimeter from the limbus, passed it through the anterior chamber on a horizontal line 2 millimeters from the upper-edge of the cornea causing it to emerge through the sclera on the other side one millimeter from the corneal margin. Iridectomy was not a part of the original operation. Lebrun passed a narrow-bladed knife into the cornea at the limbus one to two millimeters below its transverse diameter and caused it to emerge at a corresponding point on the other side. The cutting edge of the knife was turned upward so that the plane of the blade formed an angle of 30 degrees with that of the iris. The knife was then drawn upward and its exit made in about the middle of the upper third of the cornea. Liebreich made his puncture and counter puncture in the sclera one millimeter from the corneal limbus, and the plane of these punctures was one to one and a half millimeters from the lower margin of the cornea. Weber employed the knife which bears his name, making the punctures in the sclera either above or below the cornea, involving only a small por-

tion of that structure at its center. Snellen incised the cornea at its upper margin making a conjunctival flap in addition.

It seems scarcely fair in enumerating the various modifications of the flap and linear extraction operations not to mention the names of Knapp, Bull, Panas, Abadie, Galezowski, Schweigger, Powers, Waldau, Critchett, and other shining lights in Ophthalmology of the last century, but an unbiased examination of their various methods shows only an adaptation in each of some of the operations already given, to meet some special requirement.

Secondary capsular cataract deserves at least a few words. Moraud⁶⁵ and Hoin⁶⁶ were the first to describe it. Needling for after-cataract however, was not suggested until 1825 by M. Silvy of Grenoble.⁶⁷ The condition was however undoubtedly recognized and treated by Wenzel, Sharp, Bell and others previous to this period, but their accounts of it are extremely vague.

With the introduction of anesthetics by Long 1842, Wells 1844, Morton 1846, Simpson 1847, and Peace and the invention of the ophthalmoscope by Babbage*, Helmholtz 1851, Coccius 1853, and Fo lin 1853, the entire subject of cataract was studied in every detail and a perfection in operative technique was attained by the painless method of operation that heretofore was considered impossible. One cannot help noticing, however, that many of the recent improvements were practiced by such master hands as Daviel and Wenzel with encouraging results without the aid of asepsis and anesthesia.

Even the employment of belladonna in this connection seems to smack of antiquity. Frederick Seip⁶⁸ of Philadelphia in 1800 in his thesis before the trustees of the University of Pennsylvania, for the degree of M. D., gives the fol-

*For many years it was considered impossible to see into the interior of the eye and the presumed responsibility rested on the strange hypothesis that the pigment of the choroid absorbed all the light which entered and suffered none to return. This hypothesis was disproved by the late Mr. Cumming, who in 1846, while a student at the London Hospital showed that in certain positions of the observer and the observed, a luminous reflex could be obtained from within the eye. Charles Babbage took up the subject in 1848, shortly after Cumming's death, from a purely optical standpoint and constructed the first practical ophthalmoscope. (Carter—Diseases of the Eye, p. 70.)

lowing information regarding the use of this drug: "Remarus, correspondent of the Hamburg Society having remarked that a few drops of belladonna dissolved in water and applied to the eyes, caused the pupil to dilate in so extraordinary manner that the iris is reduced to nothing, was led from this circumstance to suggest the propriety of having recourse to this expedient preparatory to the operation of couching the eye for cataract. Of the intimation Dr. Grasmeyer who practices the operation with great skill at Hamburg, has made a successful experiment. The effect produced by a solution on the eye continues about one-half hour affording dilation of the pupil." According to Carron du Villards⁶⁹ it was used in the time of Pliny and Causard⁷⁰ states that it was employed during Raymar's period. According to Magnus, mydriatics and local anesthetics were known to the ancient Grecian ophthalmologists. Atropin the alkaloid of belladonna, was discovered by a non-medical man named Brandes.

In the consideration of a subject of this magnitude a few words regarding one of its most important adjuncts, namely local anesthesia, would not be inappropriate. Cocain, which has done so much to render the performance of cataract extraction and other operations less difficult, was first discovered by Gardeke and named erythroxyline. It was subjected to further study by Nieman in 1857 and by him was termed cocaine. Its local anesthetic properties were discovered by Moren y Maiz in 1862 and Von Anrep in 1880 but it was not until Koller⁷¹ in 1884 published his observations on its use at the Vienna Hospital, was the true worth of the drug realized. Its effect became widespread and in 1885 after a careful trial with it, P. D. Keyser of Philadelphia⁷² demonstrated that the intense congestion following its instillation had induced a number of cases of inflammation of the eyeballs after operations in which it had been employed. Frost⁷³ in 1887 proved conclusively that it lessens the resisting powers of the conjunctiva and cornea and that antiseptic solutions are not well borne after its use. The first case of poisoning⁷⁴ by it in ophthalmic surgery was reported by this observer in the same year, in which one drop of a one per cent. solution in a child 14 years of age induced the toxic manifestations. Tropococaine, an alkaloid having similar anesthetic properties was first isolated from the Java

cocoa by Giesel and applied to ophthalmic surgery by Schweigger.

The adjuncts other than cocaine such as the eye speculum and fixation forceps that have done so much toward perfecting cataract and other ocular operations present likewise many interesting features in their history. Ambroise Paré⁷⁵ as early as 1579, described and used an instrument for holding open the lids during ocular operations which briefly stated consisted of an incomplete metal ring mounted in a metallic handle. For a long period this speculum and its modifications were rejected by surgeons in cataract operations on account of the pressure exerted on the eyeball. Benjamin Bell in 1785 in a treatise on surgery, revived its use and the instrument employed by him was similar in nearly every respect to that of Pare. Aquapendente, Sharp, Heister, Van Wy, Assa'ini, Lusardi, and Sommer each proposed during this period apparatus for holding open the lids. The acceptance of these specula was by no means general. Wardrop⁷⁶ preferred having the lids held apart by the fingers and entrusted this procedure to a confidential servant, being unable to find any assistant who could properly perform the same. Barth in 1811, Travers in 1824, Lawrence in 1826, Hugh Neill 1848, and Mackenzie as late as 1854, preferred this method of exposing the globe.

The indirect precursor of the present wire speculum is to be found undoubtedly in the instrument described by Pellier.⁷⁷ It consisted of a silver wire, doubled so as to form a loop after which it was bent in the shape of a hook. This was inserted beneath the upper lid which was then elevated and held in position by an assistant or a metal band encircling the top of the head. The direct precursor of the wire speculum was the apparatus devised by Pancoast in which a similar looped wire hook was used for each lid and united at the temporal side. This was modified by George Tiemann,⁷⁸ an instrument maker of New York, and made more convenient by uniting the hooks at the temporal side by a silver tube containing a spiral spring. A screw at each end of the tube permitted separation of the hooks at the will of the surgeon. The elder Bickerton of Liverpool is said to have fashioned a somewhat similar instrument independently, but a scarcity

of records tends to disprove this statement. The application of the spring to the instrument is attributed to Weiss and the placing the screw on the nasal side is accredited to Noyes of New York but countless other modifications have been made from time to time by nearly every ophthalmic surgeon of any prominence.

Before dismissing this portion of the subject entirely, it may be well to briefly review the methods for fixing the eye during cataract operations. Pamard was among the first to attempt this by instrumental means. He employed a spear made with two small shoulders placed one-half line from the point. This was pushed into the conjunctiva at the upper margin of the cornea toward the inner canthus in such a manner that the hand rested upon the nose, and the point was directed toward the outer canthus when the eye was fixed. Rumpelt of Dresden, a contemporary of Pamard, mounted a similar spear on a thimble and used it for the same purpose. M. Beranger⁷⁹ made use of a tenaculum which he inserted into the conjunctiva below the cornea for the purpose of rendering the eye motionless. M. Le Cat in the last half of the 18th Century is quoted by Richter⁸⁰ as having steadied the eye by grasping the conjunctiva below the cornea by means of a small pair of pincers. This is perhaps, the earliest mention of fixation forceps in the operation of cataract extraction. Poyet⁸¹ secured the eye by passing a ligature or thread through the coats, a method which is still in practice by some ophthalmic surgeons. The names of Ten-haaf-Cassamata and Demours are associated with ingeneous instruments known as ophthalmostats, but owing to the undue pressure they occasioned, they were rejected. Velpeau in 1847 described an instrument composed of a small plate of shell slightly curved on one side, resembling somewhat Daviel's scoop. It was blunt-pointed and was inserted into the wound after the corneal incision had been made, with a view of rendering the eyeball motionless. To Bonnet⁸² is due the credit of having reintroduced fixation forceps into ophthalmic surgery in 1841. Desmarres⁸³ used this instrument at an earlier period perhaps, but such a fact was not recorded until 1847. Graefe employed fixation forceps in Germany in 1854 and J. P. France⁸⁴ in England in 1858.

Under the head of ophthalmic curiosities, may be mentioned and described the various ingenious operations and

instruments devised from time to time which were found impracticable. The difficulties attendant upon cataract operations in the absence of anesthesia, specula, and fixation forceps led many surgeons to invent mechanical apparatus that would complete the operation in an instant. Thomas Williams in 1838, described a peculiar instrument⁸⁵ of this character, consisting of two perforated plates, mounted in a flat handle. One plate has a large aperture with a beveled edge which rests upon the globe of the eye. The second plate is fastened to the first, and its aperture is smaller than that of the first and also beveled. The cornea should protrude through the opening when the instrument is in position. Upon the lower portion of the upper plate is fastened a knife blade which acts upon a center, and is impelled by a spring. In using the instrument the blade is fastened back by a clutch and the instrument is placed so that the cornea projects through the aperture and is in contact all around with the margin of the ring. The knife is then liberated by pressing a button, and it sweeps across the opening making a section of the lower half of the cornea.

Another instrument of this kind was used by Guerin of Bordeaux. His original instrument terminated by a sort of ring bent to a right angle on its handle, concave behind and shaped to the front of the eye to which it was adapted. It included a cutting blade in the form of a fleam, which is put into operation by a spring and immediately divides the cornea at its margin. Dumont of Normandy, likewise designed one of these instruments independently. In his, however, the ring and the handle were on the same line and its blade was applied horizontally.

The fixation needle of Edward Mooren⁸⁶ attracted some attention, before the forceps were introduced. This may be described as an ordinary needle one-half of the circumference of which has been ground away, forming a shoulder at about two lines from the point. The puncture and counter puncture are directed to be made after which the needle is inserted under the blade of the knife (inferior corneal incision) and acts as a resistant. In 1834, Savens de Feo⁸⁷ devised an instrument consisting of a small semicircle of iron, whose diameter equaled that of the transparent cornea, along the convex edge of which was placed a small bistoury and the extremity of the semicircle terminated in a vertical

handle. A small incision was first made at the outer edge of the cornea, with an ordinary cataract knife after which the free extremity of the iron instrument was passed through the incision and across the anterior chamber. The semicircle is then fixed in a convenient position, the point of the bistoury is engaged in the groove and the corneal section completed. The intention of this instrument was to avoid injury to the iris or other portions of the eye during the corneal section.

A number of ingenious instruments were also invented, by Alphonse de Grau Boulogne, a Parisian Surgeon in 1845, the best of which are described by Salter Livesay.⁸⁸ His knife-needle deserves mention as it resembled somewhat the instrument already described as Jaeger's. It consisted of an immovable spear-pointed needle firmly mounted in a handle and a movable triangular blade which was grooved on its back to permit of it being slid backward or forward on the needle. In using the instrument the cornea was first transfixed by the needle and its section completed by sliding the triangular blade forward. This surgeon also employed a fixation apparatus which consisted of a small fork whose points were wound round with silk so as just to leave the points bare and prevent their entering too deeply. He was also one of the first to irrigate the anterior chamber for the removal of cortical matter remaining after cataract extraction. A double keratonyxis needle is accredited to this observer in addition to the foregoing. It consists essentially of a handle in which are mounted two needles, broad at the base and fine at the shaft so arranged as to separate like the blades of scissors. A metal plate set into the handle when pressed upon by the middle finger communicates a slight pressure to the needles and separates them but they close by a spring when the pressure is removed. In a well-made instrument, the needles appear as one when closed, and is thus introduced into the eye. After which the blades are opened and the cataract is destroyed by alternate opening and closing of the blades.

Irrigation of the anterior chamber during the course of the operation was practiced early by Guerin, Sohmer, McKeown, and Wicherkiewicz and was later adopted by Panas, Lippincott and other surgeons. In the after treatment Chisolm and Michel were the first during this period to suggest the closing of the eyes by plaster—a very old procedure revived.

Galvanic cautery for the removal of cataract was brought forward as worthy of trial by M. Tavnigot of Paris in 1861. He introduced two cataract needles, about $\frac{2}{3}$ inch in length attached to a galvanic battery, one transversely and the other from below upward. When the needles are in contact with the capsule the current is to be turned on and the lens will be rapidly reduced to a detritus without pain.

A peculiar fixation instrument which at the same time served as a lid elevator was designed by Thomas Nunneley⁹⁰ in 1862. It took into consideration the fact that at this period the lids were usually held open by two fingers and the apparatus was provided with a ring which slipped over the middle finger. The blades of the instrument were about one and one-quarter inch long and held open by a spring. When in use the ring portion was slipped over the middle finger and the upper lid raised by the two fingers, the conjunctiva could then be grasped and the globe fixed by bringing the fingers close together, which served to press the blades together. A knob-like projection on the inner surface of the blades then inserted itself beneath the upper lid and aided in holding it open.

Among other recent operations which have not met with general approval, that advocated by C. B. Taylor⁹¹ deserves passing mention on account of the great degree of skill necessary to properly perform it. Briefly stated it may be said to be an ordinary combined extraction operation in which the iridectomy is performed at the upper segment of the periphery of the iris leaving the pupillary margin and portion of the iris attached to it untouched and free in the anterior chamber. The lens is then extruded through this opening. Another operation of interest is that of Edwin Chesshire⁹² devised in 1873, in which a section of the orbicularis muscle and integument at the outer canthus was performed as a prelude to extraction. It survived for a very short period.

Thomas Young⁹³ in 1856 offered a knife, the blade of which about $1\frac{1}{2}$ inches long and at the heel was $2\frac{1}{2}$ lines wide. From the heel it tapered by very gentle convexities of the back and edge to a very acute point. It was straight on its flat and its back was blunt. It was mounted in a suitable handle by means of a constricted shank $\frac{1}{2}$ inch in length.

C. Bader⁹⁴ in order to obviate the inconvenience arising

from the upward movement of the eyeball when making the corneal incision designed a cataract knife in which the blade is long and narrow and bent at an angle with the handle. A somewhat similar knife was employed by Taylor.

The suction method of extracting cataract was introduced in the 19th Century by Teale. It was indicated particularly in fluid cataracts and for its performance, a suction curette, consisting of a curette attached to a rubber tubing at the end of which was a mouth piece, was necessary. Bowman proposed a suction syringe for the same purpose. A glance over the preceding pages will show this procedure to be the earliest form of cataract extraction.

In concluding this very interesting subject I wish to remark that the details of the various operations devised since von Graefe perfected the operation of linear extraction, have been purposely omitted except where the differences were striking. A careful reader of this paper cannot but observe a marked similarity between many of these operations and the modifications devised a century ago by such master surgeons as Daviel, Wenzel, Richter, Bell, and others of that period, a careful perusal of whose works will amply repay even the most critical.

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ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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A Case of Primary Sarcoma of the Iris.

COPPEZ AND DE VAUCLEROY. (*Revue Generale d'Ophthalmologie*, 31st October, 1903.) Coppez and Vaucleroy report a case of primary sarcoma of the iris in a female forty-five years of age. The external appearance of the eye was normal and there was not any photophobia or lacrimation. Overlying the external quadrant of the iris there was a dark lobulated tumor which reached from the external angle to the pupillary margin. On the remaining surface of the iris there were three or four distinct and irregular black spots which did not project above the level of the membrane. The vision of the eye was reduced to one-half of normal, and the ophthalmoscopic examination was negative.

The tumor was excised by a broad iridectomy, and found to be mixed cell sarcoma containing a few vessels. Two years later the eye was quiet, showing brownish pin-head sized spots at each tip of the coloboma. One year after this the spots had doubled in size.

Four years after the iridectomy the patient returned, complaining of violent pains in the head. The eyeball was hard, the corneal scar bulged from pressure by the tumor-mass, and the corneal limbus was slightly elevated and appeared brownish in tint throughout its entire extent. Enu-

cleation was performed, and has not been followed by any local or general return in the two years' time that has since elapsed.

Examination of the globe revealed the presence of a small pigmented tumor which completely surrounded the limbus and was situated directly beneath the conjunctiva. The root of the iris at the place of the iridectomy and the corresponding portion of the ciliary body were invaded by the growth, which except posteriorly was definitely circumscribed. The remaining part of the iris tissue was slightly thickened by a limited collection of pigment masses. The cornea seemed normal. The external portion of the anterior chamber was occupied by the subluxated lens. The small pigmented spots on the iris were found to consist of metastatic foci.

The case, the author says, is cited as an instance of the danger of opening a globe containing a malignant tumor. Panas has reported five cases of cure in seven operations where the tumor was removed by an iridectomy. Fuchs, he tells us, advises iridectomy only when the tumor is very small. Wood and Pusey have collected twenty-seven cases of primary sarcoma of the iris treated by iridectomy. The histories of six only were followed for more than a period of three years, and of these, but one suffered with relapse and death from general invasion.

In conclusion, the author states that enucleation is preferable to iridectomy for the following reasons: first because opening of a sarcomatous eye is dangerous from the point of view of general relapse; second, because the suprachorioid is often affected from the beginning; and third, because metastatic foci under the form of apparently inoffensive congenital pigmentary spots on the iris may exist.

Remarks Upon Retinal Detachment and Its Treatment.

DEUTSCHMANN, Hamburg. (*La Clinique Ophthalmologique*, 10th October, 1903.) Deutschmann believes that spontaneous perforation of the attached membrane is a natural tendency toward recovery, and that it much increases the chances for the same. Spontaneous cure, in the course of an old detachment, he says is also favored by secondary inflammatory processes situated in the retina and chorioid. The more posteriorly these pathologic processes extend, the

better, he believes, are the chances of cure, provided that the trophic changes are not too profound.

In his recent cases the author has employed expectant treatment. When convinced that all simple means are without effect he resorts to the method which he originated.

He has found it best when repeated transfixions have failed to produce any adherence, to allow several months to elapse before repeating the procedure. When such methods fail, and the eye continues to degenerate, he employs injections of the vitreous body of living rabbits into the eyeball. In this way he not only fills the globe with a similar fluid, but produces an inflammatory reaction, which may produce a permanent adhesion of the retina of the chorioid. By these methods he has obtained cures lasting from eight to thirteen years in twenty-three per cent. of all cases.

The Scientific Laws which Control the Therapeutic Action of the Silver Salts.

BARNES, Philadelphia. (*La Clinique Ophtalmologique*, 10th October, 1903.) The nitrate of silver, the oldest of the silver salts, Barnes says, possesses a caustic and an irritating effect which is due to the nitric acid which is set free after the union of the silver radical with the albumin. The other inorganic salts of silver, he believes, are likewise precipitated as an albuminate, which prevents any deeper action of the silver. The therapeutic value of a silver salt, he has found, is determined by the following factors: first, it must not coagulate albuminoid substances; second, it must be soluble in water; and third, it must not produce any irritation or pain.

The important property of penetration is possessed by the organic silver salts, but of them he has found that protargol and albargin produce some irritation. Argyrol, a compound containing thirty per cent. strength silver, however, he says, complies with the factors above mentioned, and is considered by him as the ideal silver salt.

Retinal Extract (Optocine) in Ocular Therapeutics: New Observations.

DOYNE, Oxford. (*La Clinique Ophtalmologique*, 10th October, 1903.) For more than a year Doyme has employed the fresh retinae of sheep or cattle in the treatment of cer-

tain ocular affections. In rétinitis pigmentosa, toxic amblyopia, chorioretinitis, and in some cases of optic atrophy, quite noticeable improvement, he says, has been observed during the administration of the preparation; disappearing however upon its suspension. The author believes that the preparation possesses a selective action upon the rods and the cones, and that it furnishes a necessary element of nutrition.

The active principle of the preparation, "optocine," has been isolated, and the author hopes that it may be soon obtained for hypodermatic and intravenous use.

On a Special form of Acute Streptococcic Pericystitis.

POULARD. (*Archives d'Ophthalmologie*, October, 1903.) Poulard concludes his article as follows:—Besides the usual clinical forms of acute streptococcic pericystitis, there exists a special variety which has been but little described. The disease has the following symptoms: Pain on pressure in the lacrimal sac region, with rarely, slight redness or swelling. The functional troubles consist of moderate lacrimation which may not appear until the time of the disease, to disappear almost completely with the cessation of the same. Any existent slight local reaction is markedly contrasted with the swelling of the preauricular, the submaxillary, and the parotid glands.

The adenitis is of great significance in the symptomatic picture. Its prominence is such that one is tempted to designate the condition as an "infectious streptococcic adenitis with its focus of origin in the lacrimal passages." The general symptoms are marked. The evolution of the disease is rapid, the beginning of the condition is abrupt and the general picture is acute in character.

The symptomatic grouping is practically that of an infection of the cellular tissues which surround the lacrimal sac caused by the same infectious agent (the streptococcus) which produces an acute pericystitis.

Family Aniridia.

MOISSONNIER AND POUCHET. (*Archives d'Ophthalmologie*, October, 1903.) Moissonnier and Pouchet report three cases of aniridia in a woman and her two daughters. The mother, a high grade imbecile, was forty-two years of age. Both of

her corneae were seats of superficial opacities, there was a slight horizontal nystagmus, and both irides were absent. The globes were of normal size. There was a hypermetropia of five diopters.

Vision was moderately reduced.

The eldest daughter was an idiot of nineteen years of age, who had been completely blind since the age of fourteen years. Her corneae were slightly opaque and there was bilateral aniridia with nystagmus. Both lenses were subluxated and the optic nerve heads were atrophic. Intraocular tension was increased. On the upper parts of the globes, just back of the limbus, were five or six small ciliary staphylomata. The glaucomatous condition was ascribed to the subluxation of the lenses with secondary sclerochorioiditic changes.

The second daughter who was thirteen years old, was both imbecilic and rachitic. Her vision was poor. There was a moderate degree of nystagmus; the corneae were normal, both irides were absent, and one lens was cataractous.

The authors tell us that congenital aniridia is rare, they finding but twenty-four reported cases. It is often associated, they say, with other ocular defects, cataract being most frequent. Optic atrophy and microphthalmus have also been noted. Many authors, they inform us, report atrophy of the ciliary processes, which Van Duyse claims would otherwise be visible, but which statement the authors disagree with since the processes are not ordinarily visible even after an iridectomy. The subluxation of the lenses, they believe, is acquired. The glaucomatous symptoms following subluxation, they state, are due to rather an increased secretion from irritation than from any mechanical occlusion of the angle of the anterior chamber. Heredity is assumed by them to be the only etiologic factor of the condition; cases having been reported as occurring in families for a period of three generations. The affection, they have found, usually spares one sex at the expense of the other.

The Ocular Complication of Mumps.

Roux. (*Archives d'Ophthalmologie*, October, 1903.) Roux says that the complications of mumps, though rare, include optic neuritis, which may end in atrophy, keratitis, iritis, dacryoadenitis, palpebral abscess, paralysis of accommoda-

tion, and conjunctivitis. He reports the case of a soldier with a previous negative history of dyscrasia or toxemia. Fifteen days after the beginning of an attack of mumps the patient noticed that his vision was failing. Three weeks after this he was examined, when it was found that vision in each eye was reduced to one-fourth of normal, both eyes being emmetropic. There was some hyperemia of the optic disc.

In each eye there was a central scotoma for green and red. Cure resulted in two month's time.

Neuroparalytic Ocular Syndrome.

METTEY. (*Archives d'Ophthalmologie*, October, 1903.) Mettey believes that, both on anatomical and clinical grounds, the term "neuroparalytic keratitis" is too narrow a one, and that the inflammation of the cornea is but a part of a syndrome. In the first case reported, a male of forty years with a history of grave meningeal symptoms with left hemianesthesia which had appeared some twelve years previously, there developed a serous iritis, an ulcer of the upper part of the cornea, and a complete anesthesia of the conjunctiva and cornea of the left eye. Tarsorrhaphy was done, and the eye, except for the cornea and conjunctival anesthesias, was restored to normal.

The author says that in experiments on rabbits, Bernard, Duval, and Laborde have demonstrated that section of the fifth nerve has been followed by discoloration of the iris and purulent collections in the anterior chamber, in addition to the characteristic corneal phenomena. He briefly reviews the various theories of the origin of the neuroparalytic keratitis; the trophic, the traumatic, and the vasomotor, as well as the mixed ones of trophotraumatic, vasomotor traumatic, and the microbic-traumatic. Reasoning by analogy, he states, that the trophic theory is supported by pneumonic changes which are lessened by compression or section of the corresponding pneumogastric nerve, and by the trophic changes which accompany some lesions of the nervous system. He adopts the trophomicrobic theory.

In view of the fact that the eye in its entirety is involved and not the cornea alone, he proposes the term "neuroparalytic ocular syndrome" as designative for the condition. In conclusion, he reports two cases of the affection, in one of

which the pupil was much dilated and the iris appeared yellowish and discolored. In both of the cases, tarsorrhaphy was done, and in one, the cornea rapidly cleared, though its anesthesia remained.

Ophthalmometric Studies.

CORDIALE. (*Annales d'Oculistique*, October, 1903.) In this article, Cordiale reports the most interesting results of extended investigations upon corneal curvature; the technical nature of which prevents the making of any satisfactory abstract.

Subjective Skiascopy. An Original Method for the Determination of Refraction.

VAN DER BERGH. (*Annales d'Oculistique*, October, 1903.) Basing his experiments upon the tests and studies of Scheiner, Helmholtz, and Tscherning, Van der Bergh has developed a qualitative and quantitative subjective test for the determination of ametropia. As a test object, he employs a white isosceles triangle fifty centimeters high with a base of twelve centimeters, placed upon a black back ground situated at a distance of five meters. There is a central screen of one millimeter in diameter, this being arranged so as to move to and fro before the eye at a distance of one-half of a centimeter. The triangle is first placed vertically with its base down. If the figure is seen distinctly, there is emmetropia and accommodation is fixed. If it is seen indistinctly, the use of the stenopaic slit in order to determine whether the error is a spherical or a cylindrical one becomes necessary: This obtained, the triangle is rotated to a position which is perpendicular to the previous meridian, and a stylet, made parallel to the long diameter of the triangle, is passed before the eye. If the shadow moves homogeneously with the screen the error is myopic; and conversely for hypermetropia.

The degree of the ametropia is measured by the position of an inverted dark cone which appears when the stylet crosses the center of the pupil. Projecting from one side of the triangle are narrow white strips which are made perpendicular to the long axis of the triangle.

When the apex of the inverted dark cone reaches to the base of the triangle, an error of twenty diopters is pres-

ent. As the dark cone approaches the apex of the white, a correspondingly less degree of ametropia is indicated; the lateral strips giving the readings.

Plexiform Neuroma of the Eyelid.

DUCLOS. (*Annales d'Oculistique*, October, 1903.) In a child of three years of age there appeared a swelling of the outer part of the right upper lid. The mass felt as if it were composed of dense cords which extended into the orbit and seemed to not have any distinct limits. A plexiform neuroma was diagnosed, and its reduction was attempted by the use of electrolysis; this giving but a slight result. Later, the tumor was removed through the eyelid. Histologic examination confirmed the diagnosis.

Considerations Upon Subconjunctival Injections and Upon the Injections of Iodipine in Particular.

ALEXANDER, Nuremberg. (*La Clinique Ophtalmologique*, 25th October, 1903.) Whether subconjunctival injections penetrate the interior of the eye, has, Alexander says, been discussed PRO and CON by various authors. With him Naegli's tests with iodipine have given positive results but the author does not discuss the mechanism of the mode of entrance. In hypopyon, he says, Naegli has obtained good results from the employment of subconjunctival injections of iodipine. Alexander having obtained favorable results from the internal administration of the drug, also used it subconjunctivally. The extreme slowness of absorption and the pain and discoloration which accompany its use by the latter method, have caused him to return to the equally efficient method of internal administration.

Influence of Alcohol on the Course of Syphilis and Post-syphilitic Accidents.

PRINCE YAHYA-MIRZA, Teheran. (*Recueil d'Ophtalmologie*, October, 1903.) Although syphilis is as frequent in Persia as in France yet Yahya-Mirza finds that the ocular lesions of the disease are much rarer in the former place having noted but twenty-two cases among ten thousand ophthalmic patients. This difference he ascribes to the general use of alcohol in France and the rarity of its employment in Persia; believing

that alcohol aggravates the course of syphilis and predisposes the subject to post-syphilitic complications.

On Tabetic Atrophy of the Optic Nerve; the Pre-atrophic Period and Its Treatment.

DAHRE. (*Recueil d'Ophthalmologie*, October, 1903.) The latent pre-atrophic or incubation stage of tabes, Dahre says is revealed by vague but yet indicative signs: among which he briefly mentions the following: Muscular paralysis, monocular, usually partial, affecting the third or sixth, and more rarely the fourth cerebral nerves. These paralyses, he says, are usually of sudden development and of an ephemeral nature; accommodative asthenopia, lessened differential luminous sensibility, dyschromatopsia with partial blindness for red and green, periorbital neuralgia and zones of anesthesia, palpebral miosis, epiphora due to slight eversion of the lid, miosis, Argyll-Robertson pupil, Gower's sign, clonic contraction of the ocular muscles, unequal pupils, and rarely, concentric contraction of the visual field or central scotoma.

The ophthalmoscopic examination at this period reveals a low degree of hyperemia of the optic disc with a slight dilation of the corresponding capillaries. The author discusses the value of mercurial treatment at this stage. He asserts that although beneficial results are denied by some, he has noticed a definite and permanent improvement from the use of the method. In accordance with Galezowski, he finds the best results follow the use of mercurial inunctions.

Two Cases of Rudimentary Ophthalmoscopic Stigmata of Hereditary Syphilis in a Brother and Sister.

STIZEMINSKI, Wilna. (*Recueil d'Ophthalmologie*, October, 1903.) Stizeminski tells us that among the various ophthalmoscopic changes that have been held as stigmata of hereditary syphilis by many authors and denied as being such by others, are pigmentary changes in the retina, obscuration of the vessels, alterations in vessel calibre, and whitish or grayish discoloration of the optic disc, the edges of which are sometimes veiled. The author reports two cases with marked ophthalmoscopic changes accompanying the usual signs of hereditary syphilis. The first was that of a ten-year-old boy, in whom externally, the eyes appeared normal except for an internal squint which was more pronounced on the left

side. The vision of the more affected eye was one-fifth of normal, the visual fields were contracted to seven to ten degrees, while colors could not be distinguished unless they were made bright and prominent. Both eyes showed hypermetropic astigmatism.

In the right eye the temporal side of the disc was slightly pigmented and its margins, except below, were surrounded by a narrow band of pigment. At the periphery of the fundus there was a diminished amount of pigmentation, which in two places allowed a distant view of the chorioidal vessels. In the left eye, similar, though more pronounced changes were present. With correction, vision with this eye equalled six-tenths of normal.

One year later, the patient returned with a parenchymatous form of keratitis which responded to specific treatment, giving a vision of four-fifths, normal visual fields, and improved color perception; a condition which was better than that which had existed previous to the outbreak of the corneal inflammation.

In the second case, a child eight years of age, and a sister of the first case, the optic discs were surrounded by rings or pigment, and in the periphery of the ophthalmoscopic fields, there were some rarefactions of pigment. Vision with a convex sphero-cylinder lens was seven-tenths of normal, and the visual fields were normal. An attack of keratitis developed but responded to specific treatment.

The father of the children had had primary syphilis some sixteen years before his marriage, but had been treated for the same for a period of two years. The mother was apparently free from any acquired or hereditary form of the disease. Her first pregnancy had abruptly terminated in a premature labor.

Muscular Sarcoma.

LOPEZ AND PIQUERO, Havana. (*Recueil d'Ophthalmologie*, October, 1903.) Lopez and Piquero report a case of tumor which was situated in the upper part of the orbit of a child of two years of age, and which upon removal, proved to be a sarcoma with an intermixture of muscle fibers. The point of origin is presumed by the authors to have been the superior rectus muscle or the levator palpebrae muscle.

The Ocular Manifestations of Iodide of Potassium.

BONZITAT, Moulins. (*Recueil d'Ophthalmologie*, October, 1903.) Bonzitat reports a case of diffuse keratitis which appeared during the administration of iodide of potassium as prescribed by another physician. The discontinuance of the use of the drug was followed by a rapid improvement in the corneal condition.

Adenopathies in Ocular Infections.

POULARD. (*Annales d'Oculistique*, November, 1903.) Among the symptoms of a localized infection, Poulard says that ganglion enlargement or adenopathy is one of the most frequent and important. In ocular infections he has found that enlargement of the preauricular glands in so-called blennorrhagic conjunctivitis has been noted for a long time past, while more recently, the same condition has been observed in pericystitic and streptococcic lacrimal-conjunctivitis.

The author has noted small hard rounded movable like enlargements of the preauricular glands which are tender in the conjunctivitis which is due to infection by the following micro-organisms: the Weeks' bacillus, the pneumococcus, staphylococcus and the gonococcus, as well as in phlyctenular and impetiginous diseases of the parts.

He says that in chronic trachoma and in infection by the diplobacillus of Morax, adenitis is absent. In streptococcic infections, the adenitis varies considerably in accordance with the degree of virulence of the disease.

In tubercular involvement of the conjunctiva, a slowly evolving painless, though pronounced swelling of the preauricular, parotid, and submaxillary glands, ending at times in suppuration, has been noted by the author. In lupus vulgaris, and in cases in which the ocular involvement forms a part of a disseminated tubercular infection, adenopathy is absent.

Chancre of the conjunctiva is followed by a marked involvement of the preauricular, parotid, and submaxillary glands.

Considered generally, adenitis is rare in affections of the lacrimal passages, but in streptococcic infection, with either slight or marked local reaction, a preauricular or a submaxillary adenitis of varying degree (the more usually the former) may be present. Tuberculosis of the lacrimal pass-

ages produces a similar form of gland involvement as that which is found in conjunctival diseases. In affections of the eyelids for example, a styne constantly produces a painful type of adenitis. Abscess of the lids, when of staphylococcal origin, produces only a slight degree of adenitis, which is much less severe than that which follows an abscess that is due to streptococcal infection.

Bearing in mind the condition in which adenopathy is absent, slight or great, the condition, the author says, is of semiological value. He supports the theory of the infectious origin of certain conditions, such as acute trachoma and phlyctenular and impetiginous conjunctivitis.

The Production of the Appearance of a Round and Regular Pupil and the Major Circle of the Iris During Tattooing of the Cornea: Advantages Which can be Obtained by the use of Adrenalin During the Procedure.

HOLTH, Christiana. (*Annales d'Oculistique*, November, 1903.) In this operation Holth sterilizes China ink by pulverizing it, making it into a pasty liquid with water, and placing it in a test tube filled with boiling water for about ten minutes' time. This done, and the patient being properly placed, three drops each of five per cent. strength solution of cocaine and one to one thousand strength solution of adrenalin are instilled into the conjunctival sac during a period of about six minutes. To outline the pupil, the author employs a suitably sized punch, and within the mark made by the instrument, he removes the corneal epithelium with a sharp curette. Oblique punctures are then made into corneal stroma by means of a cataract needle; each resulting hemorrhage being controlled by means of cocaine and adrenalin instillations. The tattooing being done, the conjunctiva is irrigated with normal salt solution, while any necessary operative additions are made.

To be permanent in staphylomata, he says, no tattooing should be done within a year's time after the primary operation.

In cases of peripheral leucoma or phthisis bulbi, it may be necessary, he has found, to make an imitation iris. The pupil is made as above noted, and the major circle of the iris is outlined with a properly sized punch. This circle is tattooed black. Between the pupil and this circle a number of radi-

ating lines are then traced with a cataract knife and tattooed to the color that is desired.

Until recently, he has found that the colored marks were not permanent. Cofter, he states, has reported good results from a polychrome ink which was imported from Japan. Its use, however, he says, requires several sittings.

The article contains a photograph of a case showing a most excellent result which had been obtained by tattooing a case of total leucoma.

Floating Vesicle in the Vitreous.

URIBE-TRONCOSO, Mexico. (*Annales d'Oculistique*, November, 1903.) In the myopic eye of a healthy girl of fifteen years of age, Uribe-Troncoso discovered an ovoid vesicle three by five millimeters in size in the anterior part of the vitreous humor. The covering membrane was smooth and dark as seen at the edges. In its upper portion, and still more so in the lower, it was dotted with fine brownish black points. The vesicle contents appeared as if they were composed of a transparent fluid. The vesicle moved readily in the vitreous, falling to the lower portion of the eyeball when the eye was quiet. When the patient placed herself upon her side the vesicle descended to but a short distance toward the optic disc.

The author informs us that but one similar case has been reported. He believes that the cyst was of uveal origin, because of its resemblance to the non-traumatic serous cysts of the iris.

Peripapillary Sarcoma.

DE LAPERSONNE AND OPIN, Paris. (*Archives d'Ophtalmologie*, November, 1903.) de Lapersonne and Opin report the case of a forty-one year old female whose ocular history, except for poor vision from hypermetropia, was negative. Two years before being seen, the vision of right eye had begun to fail, and for a period of time she had had severe pain in her head. A few months later, she became aware of failing vision with the right eye. At that time she was told that she had a neuroretinitis.

When first seen by the authors, the tension of the eyeball was normal. There was not any pain, and vision with the eye equalled finger counting at fifty centimeters' distance.

The media were clear. At the posterior pole of the eye, there was a greyish elevation eight diopters in height which was crossed by dilated veins. At a point corresponding with the optic disc there were numerous parallel hemorrhagic striae.

Because of previous tubercular trouble this condition was suspected and an expectant treatment was tried by reason of the gravity of the case. Eight months after the first examination, an acute attack of glaucoma developed, necessitating enucleation of the eyeball. Examination revealed the presence of a peripapillary sarcoma of the chorioid of melanotic type which had slightly infiltrated the optic disc as well as the sclera, though not so far forward as the ora serrata.

Peripapillary sarcoma, the author informs us, has been rarely described, possibly because of the rapid growth of this type of tumor which soon removes the possibility of determining its point of origin.

Three Cases of Ectropion of the Uvea, or of Partial Coloboma of the Iris.

DE SPEYR, La Chaux de Fonds. (*Archives d'Ophthalmologie*, November, 1903.) de Speyr reports three cases under the above title. He says that they are similar to a case which has been reported by Gloor as one of partial incomplete coloboma of the iris.

The cases are characterized by an apparent absence of the iris stroma involving more or less the pupillary portion of the membrane. By direct illumination there seems to be an absence of the iris in the affected part on giving the impression of a large irregular pupil. By oblique illumination the "coloboma" (the term is used to facilitate description)—and the pupil can be readily differentiated. The pupils in his cases were approximately normal in size and there was reaction of the irides to light stimuli, to eserine, and to homatropin. The colobomatous area was dark brown in hue, and it was marked by numerous fine radiating striae. No appreciable difference between the level of the normal and the colobomatous areas of the iris existed. In the three cases reported, one eye only was involved in each; and beyond refractive errors, there were not any other signs of physical taint.

The author adopts the opinion of Axenfeld, that these cases are not those of coloboma, but that they are rather the results of a large ectropion of the uvea, in which the pigmented layer of the coat has become intimately attached to the stroma. This would, he says, explain the retention of undisturbed contractility of the iris.

Optic Neurites During the Course of the Acute Infections

ANTONELLI, Paris. (*Archives d' Ophtalmologie*. November, 1903.) Antonelli has made an extended study of the acute infectious diseases with regard to their production of optic neurites. He affirms that all of the acute general infections may produce papillary or retrobulbar neurites.

These inflammations, he says, are much more rarely due than was believed for a long time, to meningeal or renal disturbances; for in general, he believes, it is a question of primary peripheral neuritis which is analogous to those types that are produced in other nerves by various intoxications. Their pathogenesis, he believes, is essentially lymphatic or sanguineous in character; and it is in direct relation, not with microbic agents themselves, but with their toxin.

The lymphatics of the optic nerve sheath, he believes, are in special relation with the subarachnoid space. Alteration of the cerebrospinal fluid such as that which occurs in many forms of infection, may therefore produce inflammatory changes in the optic nerves. In other cases, the infection may first produce changes in the external part of the visual apparatus and afterward pass backward to the brain. In some form of infections, such as influenza, erysipelas, diphtheria, and others, in which the initial lesion is in the nasopharynx, the morbid products may reach the subpial space about the optic nerves through the cribriform plate of the ethmoid bone. In such cases, the compression of the nerves determined by edema which is anterior to the optic foramen results in an amblyopia or an amaurosis without ophthalmoscopic signs, and a discoloration of the optic disc (generally when the amblyopia is apparently improving), appearing some four or five weeks later. If the case is of sanguineous origin, the changes are presumably those which are due to alteration in the calibre of the vessels.

In most cases these forms of optic neuritis recover. In a number however, partial or complete optic atrophy results.

Therapeutically, the use of pilocarpine, strychnine serums and various other means which are specifically indicated, is advocated.

Note on the Anatomy of the Orbit as Studied by the Method of Microscopic Sections of the Whole After Decalcification.

ROCHON-DUVIGNEAUD. (*Archives d'Ophthalmologie*, December, 1903.) Rochon-Duvigneaud presents some beautiful plates of transverse sections made through the decalcified intact parts or portions of the part of the orbit as it is found in the new born. The tissues of the new born child were used because of a supposed better retention of normal relations due to the absence of orbital fat which is abundantly present in the adult subject. The plates, which are an exact reproduction of the actual relationships, are therefore the author says, superior to those that are obtained by localized dissections, and hence, subject to personal interpretation.

Tuberculosis of the Lacrimal Passages.

POULARD. (*Archives d'Ophthalmologie*, December, 1903.) Tuberculosis of the lacrimal passages, Poulard says, occurs under various forms. These, the author classifies in accordance with the rapidity of the process and the amount of the adenopathy.

The first class is that of rapid tuberculosis with gross adenopathies. The author reports three cases of this type. In the first two, who were children aged respectively twenty-nine months and six years, voluminous abscesses developed in the lacrimal sac. Before the appearance of the abscesses, however, glandular swelling, involving especially the sub-maxillary glands and the retro-maxillary glands, developed. After the opening of the abscess, the wound cicatrized badly. A fistula, limited by a thin, violaceous, and friable integument, persisted. Upon exploring the sac more deeply, no wall could be found; while the place which should have been normally occupied by this was found filled with softened tissue of fungoid type. This material was removed by a curette. The area was cauterized with the thermocautery, and a gauze drain was introduced. After destruction of the sac, however, the adenopathy continued to increase. The sub-

maxillary glands were always the largest, necessitating free incision into them by reason of their breaking.

A third case was in that of a woman of thirty-five years of age. She gave a history of repeated phlegmon of the sac, which, with the greater part of the lower lid was the site of a movable nodular swelling. From the time of the first attack there has been enlargement of the corresponding preauricular glands which showed small areas of softening.

The second class exhibits tuberculosis with moderate adenopathy. As illustrative, the author describes the case of a female of twenty-eight years of age who showed an old dense lacrimal tumor which was accompanied with unilateral painless adenopathy. In this type, he says, there is a recent and torpid inflammation which develops in the lacrimal gland. The sac is filled with fungosities, and there are but few granulations in the nose. Examination of his case showed general tuberculosis. There was complete cure.

In the third class there is a slow type of tuberculosis without any adenitis. The case seen by the author was in a nine year old child. In these cases, he says, there is streptococcic pericystitis developed after lupoid involvement of the lacrimal passages. There may not be any adenitis with lupus, except that which follows the streptococcus infection. Lesion of the nasal fossae, apparently tubercular, from which lacrimal involvement is presumed to have spread, may be present. Lupus of the face appears to come from a previous tubercular adenitis, or is due to a pericystitis opening upon the skin.

He asserts that the presence of adenitis in tubercular affections of the lacrimal passages is determined by factors which are still unknown. Among the varieties which do not give rise to adenitis is especially lupus vulgaris. The diagnosis of tuberculosis of the lacrimal passages, he has found, is often difficult. The local clinical signs and symptoms may resemble those which are due to other infections. The absence of other bacteria and the presence of tubercular lesions of the face or of the nasal mucus membrane, together with the typical adenitis of tubercular origin, render, he thinks the diagnosis probable.

He has determined that tubercle bacilli are usually not found in the lacrimal discharge. Inoculation, however, of this variety of bacilli into a guinea pig soon makes the diagnosis clear.

Prognosis in tubercular involvement of the lacrimal passages, he says, is far from favorable because of co-existent and secondary lesions, and by reason of the difficulty in eradication of the general disease.

Etiologically, the author considers only those cases in which there has not been any lupus of the face or of the nose. Of the three cases reported by others, in which the nasal mucous membrane was examined, but one gave a negative result. In three cases so examined by the author, a positive answer was obtained in all. These facts, he believes, indicate that the great majority of cases of lacrimal tuberculosis are secondary to similar lesions of the nasal fossae, and, in consequence, the cavities of the nose should always be examined. To explain the nasal origin of the affection, however it would, he says, not be necessary to demonstrate a tubercular lesion of the mucous membrane of the nose, because tubercle bacilli have been found on the normal surface, and hence could readily have reached and infected the lacrimal passages without affecting the nasal surfaces.

A Case of Unilateral Exophthalmos Produced by Voluntary and Intermittent Projection of the Eyeball.

SCRINI AND BOURDEAUX. (*Archives d'Ophthalmologie*, December, 1903.) Scrini and Bourdeaux report the case of a thirty-five year old man who received a blow over the right eye. The organ remained swollen for a period of eight days, when the following symptoms appeared. In the upper outer part of the upper lid there was a fine linear scar. There were not any visible gross ocular lesions. Vision equalled normal. Under ordinary conditions the position of the right globe, except for a slight downward deviation of two millimeters distance, was normal. This condition existed during all associated movements, giving rise to a diplopia in the extreme portion of the superior temporal field.

When the patient blew his nose or when he employed the Valsalva method, he noticed a diplopia and the eyeball suddenly became prominent, the direction of movement being forward, upward, and outward. The diplopia was found to be monocular. During the exophthalmos there was not any apparent changes of the pupil or in the fundus.

The exophthalmos could not be produced by any muscular effort. Alteration of ocular position and pressure upon the jugular veins, however, made a difference.

The author informs us that in the cases of temporary exophthalmos reported by Terson and others, the dependence of the condition upon the vascular system was definite as was also the case reported by Adamük, in which during mastication, the eyes were prominently forced forward. In explanation of the case reported by the authors, they assume a fracture of the upper inner orbital wall with detachment of the nasal mucous membrane and orbital periosteum. A complete severance of the tissues between the orbit and nasal fossae is excluded by the absence of emphysema of the orbit and eyelids during the induced exophthalmos, which in their opinion, was due, rather to the pressure or a bulging of the distended nasal and orbital membranes into the orbital cavity.

Total and Bilateral Hysterical Amaurosis.

Roux, Caen. (*Archives d'Ophthalmologie*, December, 1903.) Roux reports a case of this condition in a nine year old girl. The mother of the patient had had hysteria, with dysphagia some several years before. The patient had always been sensitive and "nervous," but she never had had any crisis. While crocheting, she noticed that her vision became less acute and that she could no longer work. There were not any other symptoms. Four days later, she became blind.

The pupils were fully dilated, the light reflexes on the left side being normal and feeble on the right. Pressure on the globes failed to produce any tenderness, the ocular motions being painless. Ophthalmoscopic examination was negative. These conditions with the absence of all general symptoms and the loss of the pharyngeal reflex, led to a diagnosis of hysterical amaurosis. A favorable prognosis was given.

One week after the beginning of the attack, complete paralysis of the right arm and corresponding leg with hypoaesthesia of the right side developed. In three weeks' time, vision began slowly to return, becoming normal four months after the primary failure. The hemiplegia persisted for three months' time, and then began slowly to improve.

Thirty-five cases of hysterical amaurosis, the author tells us, have been reported. In six of these, the blindness appeared in those subjects who did not have any preceeding history of hysterical trouble. Ordinarily, the blindness

comes on during an hysterical crisis, and usually it affects both eyes at once.

The duration of the amaurosis, he says, may last from a few minutes' time to several months, and its mode of disappearance is generally similar to that of its appearance. The case reported by the author is the youngest that he knows has been recorded.

The Marine and Visual Acuity.

CARRA, Paris. (*Recueil d'Ophthalmologie*, November 1903.) The author criticizes the methods of objective determination of the refraction in such cases by optometers, ametrometers, and ametropometers, particularly that which has been devised by Le Mehante. He says they are useless, troublesome, and dangerous. He believes that the subjective methods alone are incomplete and of secondary value. The objective method of fundus-reflex-test—supplemented by the method of Donders—is that which is chosen by the author.

Employment of the Diploscope, and the Blue Color of the Sky.

REMY. (*Recueil d'Ophthalmologie*, November, 1903.) In the use of the diploscope, Remy has observed that the difference in tint observed by the two eyes is due to a difference in illumination; the eye turned toward the light seeing blue, while the other one (in the lesser area of illumination) seeing white. The blue color of the sky, he says, is known to disappear when the sky is observed from a deep well. When the sky is observed through a blackened tube held some distance from the eye, it still retains its blue color. When, however, the tube is brought close to the eye so as to exclude all light except that which comes through the tube, the bluish tint soon begins to fade and the area becomes white; this contrast being quite apparent by opening the fellow eye. The objection that the central regions of the fundus are not sensitive to the color does not hold, or else with one eye the central portion of the sky would always be seen less colored. In tests made with the diploscope, it has been observed that on covering the eye seeing white, the other ceases to see blue until its fellow is uncovered: also, when looking at two disks of white which are so placed that one disappears, the gazing

eye has a sensation of blue followed by a reappearance of the white upon closure of the fellow eye.

Blepharoplasty by Double Pedunculated Flaps.

ROLLET, Lyons. (*Review Generale d'Ophthalmologie*, 30th November, 1903.) Rollet proposes a method of blepharoplasty in which vertical fold shaped flaps are taken from the tissues situated at the inner and outer borders of the orbit.

The cicatricial tissue, having been incised, but not extirpated, the flaps are rotated down or up (as the case may be, for renewal of the upper or the lower lid) over the denuded area and retained by sutures of fine wire which are removed on the fifth day.

The method, the author says, is much more efficient from an aesthetic standpoint, and allows much better movements of the eyelids, than that in which a single lateral flap is employed.

Amblyopia Exanopsia Improved From One-Fiftieth of Normal Vision to One-Third of Normal Vision by Massage.

DARIER, Paris. (*La Clinique Ophthalmologique*, 10th November, 1903.) Darier reports several cases of amblyopia from disuse, in which ocular massage markedly improved vision. This result, he states, is due first, to mechanical action on the zonule and the crystalline lens; second, to tonic action upon the ciliary muscle (and accommodation); and third, to trophic action upon the ocular tissues and fluids.

The Treatment of Certain Traumatic Ulcerations of the Cornea with Hypopyon by Early Iridectomy.

ROULLIES, Agen. (*La Clinique d'Ophthalmologique*, 10th November, 1903.) Roullies reports some cases of traumatic ulceration due to injury by wheat grains, chips of wood, and other vegetable bodies. These wounds, he says, especially in the presence of lacrimal or nasal trouble, are very often of a serious nature, and the usual means employed in the treatment of such cases, frequently fail.

In six of the nine cases reported, the author employed cauterization, atropine, lavage of the lacrimal passages, and Saemish section. He found that while the cornea responded fairly well to these modes of treatment, yet the intense iri-

docyclitic symptoms which were generally present, were not relieved until an iridectomy had been performed, after which convalescence became rapid. In the last three cases, the author has had an early iridectomy, and has thus obtained immediate and permanent relief.

Iridectomy, he has found, if practiced during the period of corneal suppuration with hypopyon, does not give rise to panophthalmitis. He therefore, believes that after a failure with the usual means of treatment for twenty-four hours' time, an iridectomy should be performed in order to check the progress of the infection and to protect the eye from the much-to-be-feared, secondary complications.

On the Pathogenesis of the Syndrome of Ocular Tumors.

DURET. (*Archives d'Ophthalmologie*, 25th November, 10th and 25th December, 1903.) Duret concludes his article as follows: From the study, we may assume that the syndrome of cerebral tumors is dependent upon several pathogenic factors; intracranial hypertension, toxic infection, edema, irritation, and hyperemia.

All of these phenomena, the author says, exist in different degrees in all of the neoplasms of the other organs of the human body, as has been described by Adamkiewicz; but when the tumor is intracranial, it presents a series of especially intense types of symptoms and signs. Hypertension dominates, and rules the other expressions, more particularly because of the resistance of the osseous envelope.

If in certain cases, the syndrome is incomplete, it may be because one of the etiological factors is absent or is not marked. If it is absent, and the tumor remains latent, it is, without doubt, by reason of the nature of the growth, its slow development, and the immunity which has been acquired to its presence. Small tumors act ordinarily by irritation; large ones, mechanically.

Treatment of Granular Conjunctivitis by Scarification and "Brassage."

CHEDONDI, Cairo. Some Reflections on the Same Subject. ABADIE, Paris. (*La Clinique Ophthalmologique*, 20th November, 1903.) Chedondi reports four cases of trachoma in which scarification and "brassage" gave excellent results. The method, he says, was first advanced by Abadie and

Darier. Abadie says the failures following the plan are due to its inefficient performance. The eyelid is to be grasped by a pair of forceps and well everted so as to bring the cul-de-sac into view throughout its whole extent. Three horizontal incisions down to the subjacent cellular tissue are then made into the tissues of the same. The tension of the lid will then as a rule cause much of the submucous granulation-tissue to be forcibly eviscerated.

The scarified area is now vigorously brushed with a rather stiff bristled brush dipped into a one-to-five-hundred strength solution of bichloride of mercury. The brush, though used energetically, must not destroy or remove the flaps of mucous membrane. For forty-eight hours after the operation, the lids will be much swollen. From this time on, for a month at least, the lids are to be treated daily with a one-to-five-hundred strength solution of bichloride of mercury applied on a cotton applicator; the mucous membrane being vigorously rubbed in order to prevent a too rapid cicatrization of the incisions.

Corneal Astigmatism and Central Chorioiditis in Myopia: Therapeutic Indications.

SENN, St. Gall. (*La Clinique Ophthalmologique*, 10th December, 1903.) Senn finds that astigmatism intervenes in the production of central chorioiditis in myopia not only by lowering the visual acuity and thus accentuating the myopic lesions and the refraction error in a vicious circle; but more particularly by means of tension at the posterior pole of the eyeball. The author has employed subconjunctival injections of table salt solutions with but slight benefit. With injections of one-to-five-thousand strength solutions of oxy-cyanide of mercury he has, on the contrary, often obtained pronounced improvement in cases of myopia which is associated with central chorioiditis. In seventy-eight such eyes this improvement was equal to thirty-nine per cent.

An Incident to Iridectomy for Glaucoma.

TROUSSEAU, Paris. (*La Clinique Ophthalmologique*, 10th December, 1903.) Trousseau, while attempting to perform an iridectomy for glaucoma in an eye under the influence of eserine, found that the iris could not be drawn out without tearing, necessitating an abandonment of the oper-

ative procedure. Two days later, the eye was found to be hypotonic, the pupil was punctiform, and there was no light-reflex, the eye having become quiet. This condition has remained unchanged for three years.

A Case of Congenital Aniridia with Subluxation of the Crystalline Lenses.

MOISSONIER, Tours. (*La Clinique Ophthalmologique*, 25th December, 1903.) Moissonier reports a case under the above title in a badly developed man of twenty-one years of age, whose family history was negative. On each side there was a complete absence of the iris with subluxation of the lens, the latter condition being more marked on the right side. A view of the ciliary bodies was not possible, although the method of pressure on the ciliary region, as employed by Trantas, was tried. The lenses were slightly opaque, the vitreous humors contained a few opacities, the retinæ were normal, and the optic discs were rather pallid.

On the Treatment of Glaucoma by Osmotic Substances.

CONTONNET. (*Archives d'Ophthalmologie*, January, 1904.) Reasoning from the well known interchangeable relations which exist between the sanguineous and the lymphatic circulations, and the changes which in part are produced by defective elimination from the kidneys, Contonnet has been led to the administration of chloride of sodium in cases of glaucoma with normal kidneys. Naturally, he says, when the elimination by the kidneys is defective, the use of the drug would prove injurious because of the resultant lymphatic edema and consequent changes in the ocular fluids.

After a careful general examination and examination of the urine, with an estimation of the amount of the same and the chlorides excreted, the patient (if the urine is normal) is placed on daily dose of three grammes of the drug. When the amount of the chlorides eliminated is equal to almost as much as that which has been ingested, and there is polyuria, the treatment may be considered as applicable. The dose may then be slowly increased to 15 grammes per day, depending upon the visual improvement and the amount of elimination in the urine. When the amelioration has attained its maximum, the treatment must be continued

for a long period of time; lowering the dosage, however, in order to avoid accidental chlorinization if renal elimination should be interfered with by any intercurrent affection. When, after the test doses, less chlorides are eliminated than before, dechlorinization should be hastened by restricting the salts used in the food and relatively lessened by the employment of diuretics.

The author reports seventeen cases of glaucoma in which he employed the above treatment. In six, the effect was excellent; in six, it was good; in one it was variable; in one, there was nothing gained; and in three, the results were bad.

Anatomico-Pathological Investigations Into the Effect of the Introduction of Iodoform Into the Anterior Chamber.

RICCHI. (*Archives d'Ophthalmologie*, January, 1904.) Ricchi concludes his article in part as follows: The introduction of cylinders of iodoform prepared by the Haab method, of cylinders of pure gelatine, or of pure pulverized iodoform, into the anterior chamber of rabbits, produces a rapid destruction of the corneal endothelium where these bodies come in contact with this membrane: This lesion is considered by the author as due to mechanical causes. In regard to the phenomena observed in the rest of the cornea (leucocytic infiltration of the posterior surface even to the basal epithelial cells and hypertrophy and necrosis of some of the fixed cells) and of the changes which he noticed in the iris, when the absorption of iodoform cylinders is tardy (i. e., disappearance of most of the vascular tunics, with multiple interstitial hemorrhages), are regarded by him as the results of compression.

The changes considered as characteristic of the action of the drug are an exudation of fibrinous appearance in the field of the endothelial abrasion, and a leucocytic infiltration of the endothelium, both intracellular and infracellular at the bottom of the anterior chamber.

A few hours after the introduction of the material in cylinder form, the drug mass becomes covered with exudate and begins to dissolve; small hemorrhages on the anterior surface of the iris, then appear.

In from two to four weeks the cylinder completely disappears.

Notes on Some Points of Technique Relative to the Examination of the Optic Nerve by the Marchi Method.

OPIN, Toulon. (*Archives d'Ophthalmologie*, January, 1904.) In this method Opin employs the greatest care to avoid traumatism to the optic nerves. The optic nerves with the optic foramina are removed intact, and the whole is dropped into Müller's fluid, in which it is allowed to remain for from eight to fifteen days. The nerves can then be removed with but little injury, divided into three parts, and placed without washing into the Marchi fluid, in which they are to remain from eight to fifteen days. After washing them, they are imbedded in paraffine and cut into thin serial sections. These sections are mounted either without staining, or are stained with the Van Gieson's solution or with hematoxylin.

The author has observed; as has Siegrist, that there is a net work of fine dark spots which follow the perineurium. These dark lines, he says, are due to the extrusion of myeline from the neurolemma, and are the result of trauma; and, therefore, are most marked at the points of section of the nerve, especially in cases in which scissors have been used. He is, he says, the first to describe dark points situated about the neuroglial cells. Formerly, he tells us, such changes were attributed to degeneration of the nerve fibers. The neuroglial cells, however, as the meeting points of the lymphatic currents, he says, are subject to toxic influences, and to this may possibly be ascribed the changes that have been noted.

Metastatic Ophthalmia Complicating Cancer of the Oesophagus.

ONFRAY. (*Archives d'Ophthalmologie*, January, 1904.) Onfray reports a case of "metastatic ophthalmia" complicating cancer of the oesophagus in which the ocular condition was ascribed to a septic embolus arising from the ulcerating oesophageal surface. Zückerkandl, he informs us, has shown that the oesophageal veins empty directly into the pulmonary veins, thus allowing the ocular invasion with ease.

Contributions to the Study of the Infectious Conjunctivitis of Parinaud.

CHAILLOUS. (*Annales d'Oculistique*, January, 1904.) This affection, first described by Parinaud, has since, says Chail-

lious, been observed by others. The condition is rare, only twenty cases having been recorded. The author gives a resume of the cases which have been reported, including five of his own. In eighteen of the cases, the involvement was unilateral. Adenopathy was present in all but one case, passing on to suppuration in seven cases.

The etiology, he says, is unknown, bacteriological experiments being negative or contradictory. The most efficient treatment is the employment of the galvanocautery or resource to excision. The condition may last from a few weeks to several months.

The author concludes his article as follows: There exists a conjunctival affection characterized by vegetations of a raspberry color, of variable form and size, and usually unilateral. With these vegetations may co-exist erosions or ulcerations. The conjunctival lesions are always accompanied by preauricular and cervical gland enlargement. The adenopathy is not always suppurative in type, but, suppurative or not, it is voluminous, very sensitive to pressure, and spontaneously painful. The conjunctival lesions and the adenopathy pass slowly on to resolution. The glandular disturbance, which may become generalized, persists longer than the conjunctival vegetations.

The clinical characteristics of this form of conjunctivitis, he tells us, have numerous points in common with those of conjunctival tuberculosis. The results of the histological examinations and of the experimental inoculations, however, prove that the two affections are not identical.

Histological examinations, and especially experimental inoculations are absolutely necessary, he believes, in order to differentiate conjunctival tuberculosis from infectious conjunctivitis. The absence of induration of the conjunctival lesions, the evolution toward suppuration of the adenopathies, the absence of eruptions which are consecutive to the vegetations of the conjunctiva, all easily differentiate the conjunctivitis of Parinaud from syphilitic infection of the conjunctiva.

The symptomatology of the cases of infectious conjunctivitis herein collected, he says, shows that one is no longer able to say of this affection that it is exclusively characterized by unilateral conjunctival vegetations, which are accompanied by suppurative adenitis. The variations which

one observes in the localization of the affection; in the vegetating or erosive form of the lesions; and in the reactions of the lymphatic system, permit the thought that under the denomination of infections may be ranged perhaps, affections from different causes. It is well, however, he thinks, to rest content to group together all affections having similar clinical characters, until the nature of the agents causing them has been established in a positive manner. Especially is this true, as he reminds us that Gifford has well said, without prejudging the etiology of infectious conjunctivitis, one should give it the name "Conjunctivitis of Parinaud," since Parinaud searched for it, classified it, and described the essential characters of an affection which was unknown until his time.

Orbital Cyst and Microphthalmos.

ROGMAN. Ghent. (*Annales d'Oculistique*, January, 1904.) Rogman reports the case of an eight month's old infant who in the place of the right eye had a cyst like a semi-transparent bluish tumor which resembled a case of a much atrophied hydrophthalmic globe, except for absence of the cornea. The lids failed to meet over this sunken mass, giving rise to lachrimation and conjunctival discharge. Otherwise the child was normal.

Tapping of the cyst allowed the escape of a clear and slightly yellow fluid. Collapse of the cyst revealed in the lower cul-de-sac a small ocular globe from the upper posterior part of which the cyst had sprung. Closer examination showed that the cyst was attached to the globe just above the optic nerve, and by its pressure and traction had forced the eyeball into its anomalous position.

As a result of these causes, an opening into the cyst was made in the axis of the globe. It was found that the crystalline lens had become ovoidal; the crystalline system as a whole being carried backward. Fixed to the lens capsule by adhesions, the iris was drawn backward, deepening the anterior chamber and making it funnel like in shape. It was found that the retina went to form the cystic wall, which anteriorly rested in contact with the external surface of the sclerotic; presenting itself at the palpebral fissure, and spreading out on the orbital vault in such a way as to give rise to a cellulo-fatty orbital cushion as well as the superior surface of the optic nerve. It then refolded into the ocular

cavity. Microscopically, the author notes particularly the existence of fibrous bands which were situated between the iris below and the sclera, with the presence of fibrous tissue which extended from the posterior pole of the lens and the opening of the cyst. In this latter fibrous structure there was a vessel which was assumed to be the hyaloid artery. The normal lens structure was almost completely replaced by a felt like substance containing blood vessels. The lens capsule was incomplete; changes which were partly ascribed to trauma and partly to disturbance of nutrition as the result of surrounding fibrous changes.

The orbital cysts accompanying microphthalmos, the author says, are generally situated at the lower part of the globe. Only three other cases of superior involvement are reported, and of these the reports are incomplete.

In the most of the reported orbital cysts of this class, the retinal structures have been found. The extension of the retina, he says, has been ascribed to imperfect closure of the cleft or to other defects. Hess, he informs us, has called attention to the frequent presence of fibrous tissue in colobomatous eyes and the possible factor of the same in preventing closure of the foetal clefts.

Two Observations on Colomba of the Eyelids.

STANCULEANO AND CASTIN. (*Annales d'Oculistique*, January, 1904.) The first case was that of a seven weeks' old infant, whose right upper eyelid consisted of a vertically oval section of tissue which was adherent to the globe to a degree that covered all but the lower corneal limbus. Its ciliary margin did not contain any cilia. The lower eyelid was very small, though its cul-de-sac was normal. The internal canthus presented a true tubercle, which was formed by the upper lid. The external canthus was absent, the bulbar conjunctiva continuing onto the skin. There were not any lacrimal orifices.

The second case was in an eighteen year old girl. On the left side the conjunctiva of the lower eyelid was directly attached to the globe covering the lower two-thirds of the cornea and the pupil. There was a defect of the upper outer portion of the iris.

The condition in each instance was ascribed to mechanical disturbance during intrauterine life.

New Researches Into the Ocular Stigmata of the Criminals Detained in the Central Prison of Nismes.

TRUC, DELORD, and CHAVERNAC, Montpellier. (*Annales d'Oculistique*, January, 1904.) The authors conclude that the visual field and the color perception of the criminals of the prison at Nismes fail to show any notable peculiarity. The ocular lesions found were, in their estimation, in no way peculiar. All considered, they state there does not exist any appreciable ocular stigmata of criminality.

Chronic Juvenile Glaucoma.

TRUC, Montpellier. (*Revue Generale d'Ophthalmologie*, January, 1904.) Truc reports a case of chronic glaucoma in a female of twenty-two years of age with a consanguineous and neurotic family history. The condition was much improved by a double iridectomy.

Juvenile glaucoma, he says, is rare, being placed at about one-half to one per cent.

Keratitis of Hereditary Syphilis and its Treatment.

ROLLET, Lyons. (*Revue Generale d'Ophthalmologie*, January, 1904.) Rollet divides the keratitis of hereditary syphilis into three classes

The first class is illustrated by a hypothetical case of eight to twelve years of age in whom the father had had syphilis several years before and had become "completely cured" The patient developed interstitial keratitis without any other specific stigmata. This form of keratitis is similar, he says, to that which is found in descendants of tubercular or alcoholic parents, and demands only tonic and local treatment.

The second form of keratitis is that which is developed during adolescence. It is accompanied by other specific stigmata of tardy hereditary syphilis, but such a subject is not immune against acquired syphilitic infection. In this class of cases specific treatment is often inefficient.

The third class is that in which keratitis is found in cases of virulent hereditary syphilis. It develops early in association with secondary lesions of the disease. Here the specific treatment finds its most extensive and best applications.

The favorite local treatment of the author in such cases is subconjunctival injections of saturated solutions of methyl blue or biiodized oil of mercury.

Radium and the X-rays. New Action of Radium on the Organism; Stimulating Action of a Feeble Dose; Distinctive Actions on Young Cells and Neoplasms; Tetanizing and Paralyzing Action on the Nervous System in Large Doses; Anesthetic and Inhibiting Action; Bactericidal Action of the Radiations; Powerful Toxic Action of the Emanations.

DARIER, Paris. (*La Clinique Ophthalmologique*, 10th January, 1904.) This article by Darier with the above heading is based on the work of Danysz and Bohn. The experiments upon lower animals were carried on in rabbits, guinea pigs, and mice. The author says the well known destructive action of the x-ray, and the radium radiations upon carcinoma is analogous to the greater effect of these agents upon new than old tissues. The bactericidal action of radium, he tells us, has been demonstrated by several authors. He has found, however, that the radium must be highly radioactive, and that it must be placed near the germ colonies.

Post-inflammatory Keratitic Vascularization.

BARRETT AND ORR. (*La Clinique Ophthalmologique*, 10th January 1904.) These authors report fourteen cases of interstitial keratitis sclerosing or with pannus, which they have studied with especial reference to the vascularization of the affected tissues. The vessels, they say, are best seen with a convex lens of twelve to twenty diopters' strength, and are of much value in the differential diagnoses of the conditions. In sclerosing keratitis, the vessels often appear large and have blunt terminations. In the interstitial form of the disease, they are fine and uniform, and do not anastomose. In pannus, they are superficial, irregular and tortuous, and anastomose freely.

The diagnosis between pannus and interstitial keratitis, they say, is most difficult when the corneal symptoms are but slightly marked. The absence or presence of active stigmata aid in the diagnosis.

The Prognostic Value of Subconjunctival Ecchymoses.

TROUSSEAU, Paris. (*La Clinique Ophthalmologique*, 10th January, 1904.) Trousseau finds that subconjunctival ecchy-

moses occur equally at all ages, and may in almost every case, follow a strain of some kind.

In hemophilia or scorbutus, the ecchymosis is merely a symptom and does not affect the prognosis in any way. In cardiac or arterio-sclerotic cases the sign is likewise of no special significance. The author has observed eighty-five cases in regard to this point, and has found that in but four of these was the ecchymosis followed sooner or later by cerebral hemorrhages; and in these instances, the relation was undoubtedly one of mere coincidence.

Dionine After Four Years of Experimentation; Revulsive, Antiseptic, Antitoxic, and Phagocytotic: Its Use in the Dressing of Wounds and in the Treatment of Corneal Ulcers. Its Analgesic Properties and Its Mydriatic Action. (Dionine Renders Still Greater Service Than Cocaine.)

DARIER, Paris. (*La Clinique Ophthalmologique*, 25th January, 1904.) Darier admits that the use of dionine is painful and produces marked reaction, but says that in the later fact lies its remarkable curative properties. He further says that certain cases seem unable to bear the use of the drug. He has employed it with marked benefit in retinal detachment, in chronic conjunctivitis, and in both acute and sub-acute glaucoma—especially before performing an iridectomy for the same because of the great relief from pain. He has found its use valuable in the after treatment of foreign body wounds of the cornea, in infectious corneal ulcers, and in the infective complications of cataract extraction. He always made use of it in the after treatment of cataract extraction when the wound is firmly closed; in diffuse corneal infiltrations; in parenchymatous keratitis in the early or late stages; and in subconjunctival hemorrhage.

He has found that the drug used as an anesthetic has some value.

Trepanation at the Level of the Visual Center for an Ophthalmoplegia Which was Consecutive to Fracture of the Cranial Vault.

BAURREAU, Tours. (*La Clinique Ophthalmologique*, 25th January, 1904.) In a child of thirteen years of age, after a violent fall and a superficial wounding of the parietal region,

signs of meningeal irritation, consisting in contracture of the right leg, paralysis of the right ocular nerve, and slight paresis of the left inferior oblique muscle, all developed. The visual fields and the eyebrows were normal.

Trepanation over the center for left ocular movements, i. e., on a horizontal line, six centimeters' distance from the lambda, revealed a fracture of the vault which had been previously unnoticed. On the following day, the ocular and the leg symptoms disappeared.

Operative Treatment of Serpiginous Corneal Ulcer.

SCHULTE. (*La Clinique Ophtalmologique*, 25th January, 1904.) Schulte has employed a fine galvanocautery needle in the treatment of this affection, making a small perforation in the center of the ulcer in order to allow the aqueous humor to escape.

When the hypopyon is abundant and thick, the author evacuates the same at the lower corneal limbus, and then makes a minute puncture with the cautery needle in the center of the ulcerous area. This opening he keeps patulous as long as may be desired by removing the small superficial mass that covers and closes it, twice daily.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

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Coryza Febriculosa Infantum.

Vos, H. B. L. (*Weekbl. v. Gen.*, Jan. 3, 1903), treating this disease mentions, as the initial symptoms, coryza, conjunctivitis, slight cough with hay fever, in infants 2 to 5 years old. This conjunctivitis is characteristic, with epiphora and muco-purulent secretion but without sensitiveness to light; there is profuse mucous secretion with impairment of nasal respiration but without sneezing. A connection most probably exists between these two factors. We see such in measles, where sensitiveness to light is combined with severe sneezing.

Venae Vorticosae Chorio-Vaginalis cum Myopia.

VAN DER HOEVE, J., reports two cases from the Leyden clinic. (1) A girl 21 years of age with increasing myopia. In 1894 M. = 5 D. In 1902 M. = 10 for each eye. The left fundus shows a temporal crescent downward from the nerve head; the right fundus shows a crescent in which a broad vessel disappears, which seemingly comes from the underside as the continuation of many deep lying branches. A retinal artery runs for some distance over this trunk.

(2) A girl 10 years of age, whose left eye has vision of 6/6 with — 1/2 D. and normal fundus. The right eye has M. of 10 D. and V. = 6/60. A broad crescent blends at the

temporal side with the disc, in which a deep vessel which collects its blood from many large branches disappears.

A strip of pigment borders the crescent which, with a few small retinal arteries, extends over the trunk of the vessel. The venous character is established by pressure on the ball, which makes the chief trunk pale while the branches become darker, these only become again pale by continuous pressure. Pressure on the common carotid and jugular vein makes the radiations darker, while they become pale with deep inspiration without pressure. We have here an anomalous direction of a vena vorticososa.

As to a possible connection with myopia H. closes with: (1) The opinion of Oeller (*Atlas seltener Opth. Befund. E. Tab. 1*), and that of Schoute (*Annales Opth.*, 1900, page 537) is correct, that venae chorio-vaginales are more frequent than is commonly supposed.

(2) A vena vorticososa chorio-vaginalis is not a symptom of staphyloma posticum congenitum.

(3) The supposition that vena vorticososa is the cause of the myopia or of its increase, must be verified by further investigation.

Inflammation of the Vitreous Body (Hyalitis).

STRAUB, PROF. M. (*Weekbl. v. Gen.*, April 25, 1903), caused this inflammation experimentally, because only diseased eyes, in a late state, can be procured; and an early diagnosis is of the utmost importance for the therapy and the very difficult prognosis.

The vitreous body of rabbits was infected with aspergillus spores (chiefly *A. flavescens* and *A. fumigatus*), as their reaction is less virulent than that of pathogenic bacteria. A slight, slowly increasing, opacity of the vitreous is followed by total synechia of the iris borders; the iris is coludy, shows radial folds and is pushed forward by an exudate. A fibrinous exudate arises in the pupil; often a small fibrinous hypopyon is present. The eye enlarges with increase of the tension. The cornea becomes slightly opaque and thicker, its surface is finely rough; after a few days the hypersensitive eye becomes quite pale; tension becomes subnormal; the hypopyon resorbs. The iris synechia may loosen, the iris dilates, so that the white exudate in the vitreous becomes visible. Vessels grow from all parts in the superficial layers

of the cornea until a few millimeters from its center. A few days later these vessels become paler and after a few weeks disappear. In its posterior part the eye becomes smaller. The growing spores are found in the vitreous and in the exudate behind the iris. They grow straight toward the retina and spread on its surface. The leucocytes are irregularly dispersed in the beginning in the anterior part of the vitreous; in its posterior part they accumulate before the optic nerve and the surrounding part of the retina. Soon a fibrinous and leucocytic exudate is found behind the iris and a layer of fibrin connects the iris-margin with the lens capsule; then the entire lens, with the exception of the pupillary surface is surrounded with a thick layer of leucocytes. A small cleft filled with a serous fluid, formed in the first days between the posterior part of the vitreous and the retina, whence this extends from the optic nerve downward; this cleft enlarges making the vitreous body smaller than its cavity, the leucocytes within it sink and form a hypopyon. On some places the retina is lifted from the chorioid by serous fluid. The retina becomes infiltrated with leucocytes where the moulds reach it. If the eye is soft, then serous fluid separates the chorioidal lamellae. The infiltration is chiefly in the capillary layer of chorioid and corp. cilia. The thickening of the cornea depends more on a serous inflammation than on an infiltration. The newly formed vessels in the cornea are on the border of the middle third or in the anterior part. When the vessels have grown in the cornea, then also vessels begin to grow from out the corp. cilia. in the anterior part of the vitreous. The new formation of the vessels in the cornea begins between the sixth and fourteenth day, they grow six to eight days, after which they begin to disappear, they are formed by the normal capillaries of the border; 2, 5 to 3 mm. from the center of the cornea they stop; 20 to 25 new vessels are counted. The keratitis is most probably the result of mould poisons, the new formation of the vessels depending on the corneal changes. The sclera thickens only when the eye becomes soft. In hyalitis, through strongly virulent microbes, the sclera becomes perforated at the sclero-corneal junction

The hypopyon in the ant. chamber may be formed by the overflow of the exudate behind the iris, which is stopped by the formation of the marginal synechia; but it can also be

formed hereafter, when the products of the metabolism of the microbes have diffused it in the ant. chamber (Chemotaxis). The iris responds quickly to atropine. The superficial layer of the lens becomes infiltrated. The post. layers swell and the post. lens surface becomes deformed. The destruction of the lens advances quickly as soon as the post. capsule is burst when the post. part of the eye becomes atrophic. Although the corp. cil. furnishes chiefly the leucocytes we can anatomically demonstrate that a cyclitis is absent and the leucocytes cannot be found on or in the proc. ciliares, but the inflammatory substances are found in the vitreous and on the ant. lens surface.

The retina shows spots of necrosis and of infiltration; also dialysis; its structure becomes unrecognizable through the infiltration. Human eyes with hyalitis do not show such a pronounced infiltration, and clinically cured cases show such recovery of the function, that a serious retinitis may be excluded. On the fourth day after infection small parts of the retina may be found free from the chorioid; these parts enlarge and lead to a complete separation. Clinically therefore the retina is endangered. 1. It is destroyed by bacterial poison; 2, it may be loosened from the chorioid.

The vitreous absorbs fluid which is shown by enlargement of the eye, and increase of tension. One eye, enucleated two days after infection, showed a 4 per cent. increase of volume; another, enucleated 8 days after infection, an increase of 52 per cent. The infiltration with leucocytes will not be found in the vitreous where most of the moulds and the products of their metabolism are, because the concentration is too strong. The dissolution of the membrana hyaloidea which gives rise to a cavity filled with fluid between the vitreous and retina begins at the optic nerve and extends downward. This place is independent of the way or place of infection. Rabbits eyes are not favorable objects for studying the new formation of vessel in the vitreous body. Straub found only spindle formed cells as beginning of this new formation. A distinct organization of this wrinkled vitreous forming behind the lens a thick membrane is found in human eyes and described as cyclitic membrane.

A report of 5 human eyes follows, where the different characteristics for hyalitis were present. S. demonstrates that the so-called panophthalmitis ought to be called purulent

hyalitis: because the chief seat of the inflammation is in the vitreous; the surrounding tissues show reactions through diffusing products of the metabolism of the microbes, chiefly furnishing leucocytes for the vitreous. Pathologo-anatomically a decided difference exists with cyclitis. Only both these inflammation processes receive their exudate from the same capillaries. Clinically no vessel-formation in the cornea is observed. S. found it just once where eserine had been used for some time. Infection of the vitreous can come from without (perforating wound of the bulb; sometime after cataract extraction) or is endogenous. Eyes with cicatrices and with staphylomatous cornea are prone to infection (Wagenmann 20 cases, Straub 6 cases).

The explanation of endogenous hyalitis is more difficult. A primary focus must form in the chorioid or retina round the infected vessel. The specific conditions for the life of the infectious matter will determine, if the corpus vitreum chiefly will be infected. A disproportion exists between the small initial focus and the extensive hyalitis. S. never found a cicatrix of a focus of inflammation in the chorioid or retina after a healed hyalitis. (A similarity is found in the metastatic pleuritis or joint-affection: the infectious matter comes in endogeneously and the focus, which infects the joint or pleural cavity per contiguitatem, remains masked.) Straub saw 26 cases of endogeneous hyalitis in eyes free from staphyloma and cicatrix; in 14 cases a primary focus could be found in the body (ozena, meningitis, sepsis after abortion, coryza or acute conjunctivitis, furunculosis—pyemia); in 12 cases no cause could be detected. Of these 12, five were infants, one had had measles, one showed the measles-exanthem 6 days after the beginning of the eye-trouble.

Clinically we may distinguish 3 forms:

1. Light cases with redness, photophobia, slight iritis, marginal synechia, fibrine in the pupil, diffuse opacities in the vitreous. After the eye becomes painless and pale, the vitreous needs at least 2 weeks to clear up.

2. Moderately severe cases show besides chemosis, protrusio bulbi, hypopyon and elevation of tension. Rest in bed and atropine (?) lower the tension quickly. Often the eye becomes soft. After the eye becomes quiet 2 months and more might be necessary to clear the vitreous. They

may heal without leaving any vestige of the earlier inflammation, except remains of the marginal synechiae or real synechiae, when atropine is instilled too late. Danger of solutio retinae is present and contraction of the shrunken and organised vitreous body. The condition of the retina during the inflammation can only be found with focal illumination and Purkinje's phenomenon.

3. In the most severe cases purulent hyalitis, with perforation of the sclera at the corneo-scleral junction happens (so called panophthalmitis). Atropine is indicated even when the tension is high (more than half the cases); it lowers the tension even below the normal and lessens the pain; it is valueless in those cases, which will perforate. Iridectomy is entirely superfluous. When chemosis ensues serious swelling of the eyelids or protusio bulbi are present; repeated cold compresses are beneficial. In the intermediate cases salicylic acid proved of decided benefit. Care should be taken to distinguish uveitis luetica Foerster: very fine opacities of the vitreous which never becomes entirely opaque.

A Pocket Skiascope.

KOSTER, PROF. W. (*Weekbl. V. Gen.*, May 9, 1903), uses a skiascope, consisting of a double loupe à recouvrement, after the pattern of Prof. H. Snellen, Jr., which had all combinations from 1 to 10 D., K.'s instrument has the concaves all on one side, the convex at the other, so every value from 1 to 31 D., can be combined. The diameter of the loupe is 25 mm., of the glassplate 20 mm. the total thickness of the 5 lenses is only 11 mm., the total length of the instrument is 9 cm.

Cinchonin Intoxication.

SCHOUTE, G. J. (*Weekbl. v. Gen.*, July 4, 1903), relates the following case: Mrs. S., 40 years old, suffering from malaria for several months, has an idiosyncrasy for quinine, as have her mother and two sisters. She takes 3 powders M O, 4 sulf. cinchonini at intervals of one hour before going to bed. In the morning, although it being clear daylight, she is unable to distinguish the minute-marks of her watch or to read her thermometer. She complained that after taking the powder she "could not see." which meant "not see at short distance."

Schoute examined her after she had taken the previous night at 9 and 10 o'clock one powder and one the next morning at 8:30. In the evening her vision was not impaired; the next morning at 9:30 still normal, pupillary width 3 mm., punctum prox. 25 cm. The same day at 2:30 p. m., pupillary width 3,25 mm.; V. O. D. < 1 ; O. S. < 1 . Punct. prox. 90 cm. All pupillary reactions still normal. Patient's condition was again normal at 4 p. m. Another time, taking her powders at 6, 7 and 8 o'clock p. m. the visual disturbance began at 11 o'clock. A. M., was the worst at 2:30 p. m. and had passed at 9 p. m. She took once more at another time of the day the powders and had a corresponding visual disturbance.

Cinchonin caused therefore here a paresis of accommodation without any other ocular symptom.

Pigmented Optic Disc.

DYCKMEESTER, H. (*Weekbl. v. Gen.*, July 11, 1903), examined a 49 year old healthy lady, who visited the polyclinic at Leiden with presbyopic complaints. Except irregular uterine hemorrhages 3 years ago, which stopped after a small operation, no previous sickness. The eyes were never inflamed. Refraction: Hyp. 3 D. The left disc showed a small temporal crescent and venous pulse. The right fundus was not darkly pigmented. The disc has a distinct scleral ring with a temporal crescent from the horizontal meridian to nearly the inferior end of the vertical one. An elliptic dark blue spot with greenish hue is seen at the temporal margin of the ext. inf. quadrant, the size of half of this quadrant. The color of the center is somewhat lighter than the center, while an ovoid spot of dark color is found in the upper part of the center. With a minus lens this ovoid spot becomes more distinct; it gives a parallax motion against the rest of the change; it forms most probably a cavity; its depth is difficult to determine on account of the absence of other marks; the image becomes decidedly indistinct with 3 D. The lighter center shows also a following parallax motion although much less against the periphery. A vein disappears at its lateral margin. A branch of the A. temp. inf. goes over the under part. No changes in the other vessels.

We have here a congenital pigmentation of the optic disc with the presence of the small cavity. An insufficient ab-

sorption of the excessively developed embryonic pigment of the nerve might be accepted. D. thinks that a connection exists between this pigmentation and the abnormal vessel. Pick observed strong pigmented bundles from out the pigmental layer in the formation of the optic nerve in human embryos after the seventh week. The persistence of these pigment masses could form a hindrance for the normal development of the venae. The normal courses of the arteries depend on the greater pressure of the arterial blood which overcomes more easily a distal resistance. Anatomical examination only can decide, as we can not follow the vessels in the optic nerve

Congenital Word-Blindness.

LECHNER, C. S. (*Weekbl. v. Gen.*, Aug. 1, 1903), was consulted by a farmer's son, 13 years old, for blepharitis ulcerosa with conjunctivitis phlyctenulosa of the right eye. On determining the vision the patient begins to cry. The father told that his son could not read, knew the letters only partially, although he had been in school for years. The anamnesis taught the following: Both parents and five children are healthy. No hereditary taint. Measles in early life and shortly ago influenza. Patient is very nervous, but looks a healthy boy. V. = 5/5; Refraction, emmetropic. Ocular motions and fields of vision, normal. The child had to be brought to school by force. After two years in the first grade he did not yet know the letters. After five years study he knows only a few letters well, and always, with some he makes continual mistakes, others he does not know at all. His name, which he writes pretty decently, he can read with some difficulty. The simplest words of one syllable written or printed are with very few exceptions a riddle for him. But he can enumerate the letters of the alphabet quickly and faultlessly (ear memory). His general memory is good. He writes all that has been written for him, without understanding. He cannot memorize the letter figures for a moment. He has far less difficulty with figures, he counts quickly to over 100, and can also read the different figures and pronounce faultlessly small written numbers. According to his age he can add, subtract, even multiply. The Snellen's hook were used in determining the vision. His recognition power for the surrounding objects is normal. In no

way he is behind, he does home duties quicker and better than his brothers. Of this condition 12 cases are known. Hinselwood published the first two cases in the *Lancet*, May 21, 1900, and two more in the *Ophthalmic Review*, April, 1902. Nettleship published five cases in this same Review, (March, 1901). Pringle Morgan (1896) and Bastin (1898) published each one case (cited by Hinselwood). Nine of the eleven are boys. Word-blindness is a part of alexia. We shall have to look for changes therefore in the neighborhood of the gyrus angularis and supramarginalis. Serious objections exist to accepting a congenial defect of the cortex. Early recognition of the condition is of great importance to prevent many annoyances to the patient and for a rational treatment: taking away from the usual school course and giving of private instruction. The result is sometimes unexpected. One of Nettleship's patients became a lawyer.

Weak Vision Through Non-Use.

STRAUB, PROF. (*Weekbl. v. Gen.* Aug. 20, 1903), mentions in the Biologic section that we often find combined hypermetropia, strabismus and poor vision with negative ophthalmoscopic finding. Having examined many cases of monocular diminution of the vision in recruits he found nearly always hypermetropia. Strabismus was, however, so often absent, that this diminution could not be caused by strabismus. The weak vision rather had to be considered to be primary, which causes strabismus in part of the cases. Observation on persons, whose weak eye became stronger through exercise speak against it. A slight amelioration by exercise after strabismus operation is often observed. A very convincing case was seen by Straub, which is in opposition to the facts, which demonstrate that the visual weakness must be primary, namely that it is secondary, that is the consequence of non-use with strabismus. One observation against our opinion must be accepted with greater thankfulness, than many observations agreeing with our ideas (Schweigger). Straub relates the observation of Tscherning, that he and some of his co-workers have an "oeil-directeur." The same will be found with many hyperopes, even if they possess two good eyes and binocular vision. In this the nucleus of squint will be found, as also of the diminution of the vision through neglect. The phenomenon is therefore a particular weakness

of the binocular vision, where the retinal images of the one eye for perceptions and for the impulse of movements is of much more importance than those of the other eye.

Straub enucleated the left eye on Sept. 2 in a 15 year old girl, who came under treatment Aug. 24, 1896, with a shot wound. It was her good eye. The other eye was hypermetropic 7 D., squinted and fixed eccentrically. $V. = 2/60$; with $+ 6 D = 3/60$. She exercises with large print. Oct. 15 she has gained, but V is still $3/60$. She can fix with the macula at very short distance; for distance she uses an eccentric spot. Nov. 6 she sees in the distance with the macula, $V =$ nearly $1/10$; May 21 1898, reads $1/6$ without and with $+ 6$; June 15, 1899, $V. = 1/4$; with $+ 5 = 1/3$ full. April 19, 1901, V. with $+ 5$ nearly $1/2$.

Taylor's Knife for Eye Operations.

STRAUB, PROF., speaks in the surgical section (*Weekbl v. Gen.*, Sept. 5, 1903), about Taylor's knife, that is, the curved Bowman's broadneedle. He saw some ophthalmologists in England use it for corneal incision for optical iridectomy. MacHardy even used it for all iridectomies. Straub uses it now for optical iridectomy and also for glaucoma, because the wound can be enlarged by a motion to the right and left. A very peripheral wound can be more easily made than with the lance and the needle remains free in the place when one wishes to give to the wound a lateral motion. The great advantage of the instrument is its suppleness. An ulcer cum hypopyon, which does not respond to cauterization, must be cut through its bottom, continuing in the healthy tissue on both sides. Section with Taylor's knife prevents the synechia ant. which usually happens with von Graefe's knife. Straub usually incises the under border of the ulcer and enlarges the wound on both sides in the healthy tissue. With curved iridectomy forceps, he enters the ant. chamber and evacuates the fibrinous hypopyon through the wound.

This operation is absolutely indicated when higher tension is present; the evacuated hypopyon does not reform. Taylor's knife is very useful for cutting away an ant. synechia. The limbus corneae is incised at a place not too near to the synechia, the instrument is moved toward the margin of the synechia, which then is turned round on an axis, perpendic-

ular to the blade and to the center of the corneal wound. Mostly with one stroke the entire synechia is cut free from the cornea. If necessary the instrument can once more be turned in the opposite direction. A small synechia can be rent with a Taylor's silver hook, if necessary. Straub made in every case the ant. chamber equally deep in its entirety. The English instrument had a maximum breadth of 2,5 mm., the curved part is 10 mm., long. Straub prefers Luer's instrument, the curved part of which is 12 mm. long.

Dr. Blok thinks that cauterization of the ulcer with nitrate of silver makes an operation unnecessary; he finds that on turning the Luer's broadneedle it yields and does not cut well.

Straub uses nitrate of silver, 20 per cent. in the beginning but advocates not losing time when the ulcer is progressive.

Excitation of the Cervical Sympathetic by a Bullet.

WESTERVELD, H. W. (*Weekbl. v. Gen.*, September 19, 1903), half an hour after the accident examined a man, 34 years old, who was shot with a revolver at a distance of some 15 feet. He had not been rendered unconscious at first and had washed the wound himself. The two front incisors of the lower jaw have disappeared with a small piece of the jawbone. Under the tongue, at the left side, is a penny large wound, also at the upper side in the base of the tongue. A small wound is found in the upper part of the arcus palatopharyngeus. The left side of the neck is swollen and painful on palpation. Patient speaks and swallows with difficulty. No abnormal quantity of saliva. Left pupil is larger than right. Reaction for light and convergence present. Eye-clefts on both sides of the same size. No exophthalmus. Tension of both eyes equal. Left side of the face and neck to the clavicle sweats profusely. No difference in color or temperature of the skin on both sides. No ophthalmoscopic changes. Rectal temp. 38°, pulse 64. Normal respiration. With Roentgen rays the bullet is found near to the vertebral column in front of the 2d. and 3d. cervical vertebra. Diagnosis: wound of the sympathetic nerve. Next morning temp. 38°,6, pulse 68. From now on the temp. diminished slowly and the pulse rate increased. On the next day the mydriasis and sweat secretion disappeared. After 4 weeks

the buccal wounds have healed. Patient goes home with normal temperature and pulse and little complaint of swallowing. The mydriasis and intensified sweat secretion were therefore here caused by excitation.

In the *Deutsche Zeitschr. f. Chirurgie*, June, 1902, van den Briele describes a case of unilateral cutting through of the neck-sympathetic. Patient showed ptosis, myosis and exophthalmus, which were still present 14 days later on leaving the hospital.

The Significance of Staphylococci in the Formation of Ophthalmia Scrofulosa s. Eczematosa.

VAN HAAFTEN, A. W. (doctorate thesis), historically expounds the present state in regard to the names used as well as the etiological conception.

Van Haaften examined 39 patients with benign scrofula. They all had light cases of inflamed eyes, a few with only one or two phlyctenae conjunctivae, without any vestige of exzema, blepharitis, nasal catarrh, etc. He looked only for staphylococci. With a sterilized Pasteur pipet, a small quantity of conjunctival mucus was sucked up and dropped on gelatine plates. The same was done with the nasal secretion and the buccal mucus. These plates were placed in the thermostat, temperature 20° 23°. The colonies of staphylococci were grafted in tubes with gelatine (puncture cultures) and in tubes with slanting coagulated agar (linear plate cultures). The first ones were kept in the same way at 20°-23°, the linear cultures at 37°C. Microscopically they were examined with Löffler's methylen blue. In dubious cases grafting in rabbit's corneae was performed, where they must produce peri-corneal injection and infiltration round the wound. This method did not give a result as to the whole of the conjunctival sac. The intention was to take a sample, the same as much as possible for all cases, for determination of the density of the presence of the staphylococci in the conjunctival sac. A culture of staphylococcus was present in the conjunctival sac, if many staphylococci are found in the gelatine plate. A sterile plate demonstrated, not that the conjunctival sac or the mouth was free from staphylococci, but that few were present. These eyes (51) gave:

20 with no staphylococci,	} Total 60 per cent.
8 with a few "	
23 with > 5 "	

In the 10 examined cases of blepharitis only 10 had none, 1 : 10., and 7 cases very many.

In nose and mouth in 15 respectively, in 12 cases these germs were found. Cultures from both conjunctival sacs, nose and mouth were sterile only in 3 cases.

Are the staphylococci the real cause or the result of a secondary infection ?

Van Haaften therefore examined the conjunctival sac of both eyes in 24 young people with decided normal eyes and lids. In these 45 normal eyes:

30 times no staphylococci were found.

9	"	a few	"	"	"
6	"	5 (2 times 40)	"	"	"

It is tempting to deduce from these facts, that the staphylococci cause the kerato-conjunctivitis eczematosa. But the pericorneal injection, the increased lacrimation, the strong photophobia might have influenced the number of bacteria. Therefore irritated eyes, but by no other cause, were examined, namely, injection through a foreign body, chalk burn, beginning iritis, trachoma, etc., 18 patients, between 2 and 16 years old, had:

23 red eyes.	{	15 times no staphylococci.
		16 " a few "
		2 " > 5 "

and

10 healthy eyes.	{	7 times no staphylococci.
		2 " a few "
		1 " > 5 "

16 patients, between 16 and 34 years (one was 51 years) had:

17 red eyes.	{	12 times no staphylococci.
		2 " a few "
		3 " > 5 "

and

14 healthy eyes.	{	6 times no staphylococci.
		5 " a few "
		3 " > 5 "

Thus, in these 34 cases with 40 red eyes, 13 times staphylococci = 33 per cent., so that the conclusion is justified that

irritation as such does not favor the growth, and they play a decided part in the origin of the benign scrofulides. They come from out the normal conjunctival sac. Uncleanliness and bad care are favorable. We must also count with the constitutional predisposition ("scrofulous constitution"). Persistent, often relapsing eczematous ocular affections will be found often of tuberculous origin. Van Haaften made four rabbits tuberculous with the same culture of tuberculous bacilli; after five weeks these four rabbits and two control rabbits are inoculated in the cornea with a strong culture of staphylococci. Two rabbits which were made tuberculous in the abdomen and the two control-animals had their right cornea alone inoculated; the two rabbits which were inoculated in the corp. vitr. of the right eye, had both corneae inoculated. The first day after the inoculation the reaction of both eyes made tuberculous in the corp. vitr., was much stronger than that of the eyes of the other side, this difference was less marked on the second day, and disappeared altogether. The eyes of the other rabbits did not show marked reaction. The eyes of the two control-rabbits were quiet four days after inoculation, while the eyes of the tuberculous animals were not quiet until after seven to eight days. Four rabbits were made tuberculous with an emulsion of the tuberculous bacilli in the abdomen; six weeks later these four and three control rabbits were inoculated in both cornea with a weak culture of staphylococci. The four tuberculous rabbits showed a stronger reaction than the three control ones; infiltration around the injection canal with exudate on the surface.

In a third series the four tuberculous rabbits of the second series are inoculated in both corneae with staphylococci, also one rabbit, which fourteen days previous had become injected in the ear vein with tubercle bacilli; one rabbit which three months previous was infected in the abdomen with tubercular cheesy matter, and five control-animals. The rabbit which was infected through the ear vein showed the strongest reaction, and section showed that it had generalized tuberculosis. Not much difference was shown by the other rabbits. We are entitled to conclude that tuberculous animals react stronger than normal ones to a local staphylococci infection.

Acute Paralysis of Both Nervi Abducentes.

RUYS J. A. (*Weekbl. v. Gen.*, Dec. 19, 1903) was called

by a man 56 years old, who had become unconscious after coitus. Previously he had once been dizzy—a Lipothymy—most probably dyspeptic, had suffered a long time with pleuro-pneumonia after influenza, a few years ago he had severe gallstone colic. His liver was enlarged. Patient was very active and lived a moderate life. As he was afraid of nephritis or diabetes he examined his urine often and had found the day before a high specific gravity. Patient vomited much mucus and gall, face and conjunctiva congested. He knew nobody. Both eyes turned constantly inward; pupils pretty narrow, equal, with normal reactions. Pulse 68, high tension, somewhat rigid; temp. 36. Skin sweated. A few hours later his vomiting stopped. In the afternoon the sensorium cleared, he suffered severe headache and urinated, large quantities. Spec. grav. 1018 with much sugar and albumen (5 pro mille Esbach) without formed elements; no acetone. On the following day the polyuria had disappeared only a vestige of sugar left, which was gone the third day; so with the albumen. Patient remained doting, complaining of the heavy pressure in his head, saw all in a haze, double and irregularly. All ocular muscles acted normally with the exception of both recti externi: the left was stronger affected than the right. All muscles of his face, limbs and body could be used well, but with great exertion.

No patellar reflex; even a few days later all reflexes were still absent. A most obstinate constipation had to be combatted with high irrigations and large doses of casc. sagr. During the first days strong congestion of the head appeared, then the pulse became less frequent. The headache became less frequent. The headache was almost unbearable. As this pain lessened paraesthesias in hands and feet, always more on the left side appeared, with severe muscular pains in neck and calves which last ones remained for a fortnight. The paraesthesias were gone 5 weeks after the accident; he could walk again. Double images remained the longest; his left eye saw much worse (he had always been myopic-astigmatic in the left eye, hypermetropic in the right one) in reading he was much troubled with disfigurements; the letters did not stay in one straight line, in the lines were bends. . On the sixth day Dr. Noyon found besides the complete paralysis of both abducentes, both papillae somewhat indistinctly swollen, perhaps a hemorrhage in

the left retina (examination could not be done exactly enough.) Later however as the paralysis had disappeared for the greater part, a papillitis was found and a hemorrhage in the retina of the size of the nerve-head, in both eyes.

Ruys thinks that a cerebral hemorrhage in the neighborhood of the floor of the fourth ventricle should explain the different symptoms.

Embolism of the Central Artery of Both Eyes. Recovery.

STOCKE, E. (*Medisch Weekbl.* 26 December, 1903), was called in the evening of August 8, 1900, to a 82 years old man, who had become suddenly blind. He had been healthy until then. Reading his paper his vision became clouded, then he saw all green and directly after he could see no more. Patient complains of some slight headache and dizziness; his face is pale, pulse irregular, intermittent, very small and weak. Insufficiency of the mitral valve and a general atheroma of the vessels is found. Ophthalmoscopically embolism of the central artery on both sides is found. The arteries were fine threads, partly discontinuous, the venae showed an irregular caliber, the pupil was whiter and the yellow spot was seen as a small red blot on the pale fundus; no hemorrhages. Therapy Tr. Strophanti with Digit., a glass of warm wine, horizontal position, washing the heart region, face and pulses every half hour with alcohol and water. S. himself used massage of the bulbs. Next morning vision had recovered, so that only a fog remained before the eyes; the fundus had a good color, the arteries were quite visible, the venae showed a very irregular caliber. The pulse was less irregular, still somewhat intermittent. Next day patient read his paper again and a few days thereafter he was up again.

Glaucoma Caused by Emotion.

PETERS (*Med. Weekbl.*, Oct. 24, 1903) tells how a woman about 50 years old who had been operated for cancer of the breast, lost the vision of the right eye after violent emotion through glaucoma. She recovered under pilocarpine, but ten days later again lost the sight of this eye in the same way; again recovery under pilocarpine. V. with $+1.5D = 5/5$.

Being 5 days at home glaucoma came on now in both eyes after another emotional attack. Next day a double iridectomy was done. Patient had V. with $+1\text{ D} = 5/7.5$; with $+3\text{ D}$ she read print.

P. thinks that emotion excites the sympathetic nerve in nervous people, in this way the heart brings in a smaller time-space a larger quantity of blood in circulation, while at the same time the smaller vessels are more contracted under this contradictory pressure the fluid expands the vessels, increases the tension of the eye until the highest degree causes the glaucoma and the blindness.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

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Hungarian Contributions to Ophthalmology.

SCHULEK, PROF. WILHELM. (*Wiener Medizinische Presse*, Dec. 6, 1903.) This report contains eight articles, two of which are devoted to trachoma. Imre deals with the surgical treatment of trachoma. He prefers, in most of the cases, scarification to other methods.

Blaskovics reports the open wound treatment after cataract operations; this method proved very successful in the eye clinic in Budapest. He then deals with the operation for juvenile cataract, where the linear extraction, combined with iridectomy proved most successful, as not a single eye was lost after this operation.

Scholz reports the histories of two patients, suffering from expulsive hemorrhages after an operation for glaucoma. The report includes microscopical examination, and concludes with the following remarks:

1. In operations for senile cataract there are no symptoms by which the occurrence of expulsive hemorrhages could be foretold.

2. In iridectomies on glaucomatous eyes with some vision, there are no expulsive hemorrhages to be expected, but an expulsive hemorrhage may be expected in eyes, which became blind by glaucoma, especially where symptoms of previous inflammatory processes can be found, or where there is a suspicion of a preceding retinal hemorrhage.

Leitner deals with the prophylaxis of blenorrhoea neonata.

torum and finds that the method recommended by Credé is still the best.

A second report by Scholz deals with the history of the treatment of trachoma, embracing all methods, from the oldest to the most recent ones. He then describes the method of treatment as it is employed in the clinic of Budapest.

Gross reports about sympathetic ophthalmia, and concludes, that, although we do not know the anatomical direction, still the physiological and pathological symptoms lead us to believe that the infection travels through the nerves.

The Diagnostic and Prognostic Importance of Affections of the Retina in Nephritis.

ELSCHNIG, A. (*Wiener Medizinische Presse*, Dec. 6, 1903.) The author has examined in five years 209 cases of nephritis; ten cases showed grave affections of the retina, which had no connection with nephritis. In the other 199 cases he found the following ophthalmological changes: Normal retina in 74 cases (37.5 per cent.). Arteriosclerosis or perivasculitis, occasionally with slight retinal edema in the region of the papilla in 60 cases. Inasmuch as similar changes can be found in alcoholic and syphilitic patients, these findings cannot be looked upon as pathognomonic of nephritis, and this would make the number of negative findings 134 cases (74.60 per cent.). In contrast to these cases he finds in 65 cases (32.5 per cent.) outspoken pathologic and pathognomonic changes in the retina.

1. Atypical slight retinitis albuminurica (arteriosclerosis), hemorrhage and yellowish degenerated patches in the retina in 15 cases, i. e., 7.5 per cent.

2. Atypical severe retinitis, infiltration of the papilla and retina, severe vascular affections, numerous degenerated patches and hemorrhages in twenty-four cases, i. e., 12 per cent.

3. Typical retinitis albuminurica, with characteristic stellar figures in the region of the macula in thirteen cases, i. e., 6.5 per cent.

4. Retinochorioiditis albuminurica, severe retinitis with chorioiditic nodes in six cases, i. e., 3 per cent.

5. Other pathologic changes:—atrophy of the retina after retinitis, one case of retinitis proliferans, thrombosis of the

retinal veins, etc., in seven cases, i. e., 3.5 per cent. In four cases of retinitis, detachment of the retina followed. In ten cases of acute nephritis there were no changes in three, there were only slight changes in five, and in two there was a slight atypical retinitis. As regards the age, he finds the following: in seventy-eight cases below 30 years there were pathological changes in the retina in twenty-one cases, i. e., 26 per cent.; in 121 cases above 30 years forty-four cases, i. e., 36 per cent. had changes. The prognostic importance of the retinal changes as regards the prognosis *vitalis*, may be seen by the following record: Of the seventy-four patients with normal interior of the eye only three died from nephritis within six weeks, i. e., 4 per cent.; of the sixty patients suffering only from arteriosclerosis four died within six weeks. and six within six months, i. e., 10 per cent.; of the 134 patients without pathognomonic retinal changes, nine died within six months, i. e., 67 per cent.; of the sixty-five cases of nephritis with pathognomonic retinal changes sixteen died within six weeks, and seventeen within six months, i. e., 26 per cent. The high mortality of nephritic patients suffering from retin-ochorioiditis albuminurica is especially noted to be, all six patients having died within 6 weeks after the chorioiditic nodules were observed. This last form of nephritic retinal affection is quite unknown.

Keratitis Neuroparalytica and Similar Affections.

ALBRAND, WALTER. (*Wiener Medizinische Rundschau*, Oct. 25, 1903.) Opinions of different authors vary as regards the nature of this comparatively rare form of disease, firstly because etiologically the experimental as well as the clinical observations show numerous factors, which could be accounted for, for the onset of the affection. The different opinions as well as the different nomenclatures (*Keratitis xerotica*, *e lagophthalmo*) make the processes in question, which appear under the same clinical picture to be of a different nature, and can be embraced in one group of corneal affections only conditionally.

The author now enumerates the different opinions, as regards the nature of the affection and cites Magendie, who considered the corneal affection a sequel to the trophic disturbances as they occur after experimental section of the trigeminus. Saemisch considered this keratitis to be of trau-

matic nature, produced by anesthesia. Feuer considered the affection a xerotic process, similar to keratitis e lagophthalmo. The author, however, coincides with Grosz, who thinks that a true keratitis neuroparalytica is due to a degenerative process in the ciliary ganglion, produced by cachexia, hemorrhages, injuries, etc. Berger and Loewy consider the affection due to nutritive changes in the cornea, produced by changes in the nerve fibers, not of the ciliary or Gasserian ganglion but in the sympathetic. The writer concludes that the true form of keratitis neuroparalytica is due to changes in the trigeminus especially in the trophic fibers, which come from the sympathetic. Other similar forms of keratitis are to be separated from this form; these being more of a symptomatic nature, and are mostly due to a faulty closure of the lids (facial paralysis, scars and defects in the eyelids, exophthalmos, sopor, etc.). To this group belong the purely anesthetic forms of keratitis due to paralysis of the trigeminus alone, and not of the fibers of the sympathetic.

The author cites a case of genuine keratitis neuroparalytica. A middle aged woman suffering from severe neuralgic pains in the region of the right trigeminus, was operated on several times with a very good result; the different branches of the nerve having been cut, the severe pain ceased. The condition of the right eye, ten years after the several neurotomies, was as follows: the bulbus was in a squinting position, and annoying double vision. In the lower, inner part of the cornea there was an ulceration with an infiltrated yellowish margin; slight epiphora; sensibility of the cornea and conjunctiva diminished. The ophthalmoscopic examination showed a normal condition. There was almost complete ptosis. The lids could not be closed; the aperture was about 3 mm. wide, and corresponding with this aperture the ulcerated portion of the cornea could be seen. On the side of the face there were a number of deep-seated scars, which were produced by the neurotomies in the fossa sphenomaxillaris.

The case is interesting, because the ulcer on the cornea, which appeared after the neurotomy of the trigeminus, and showed a torpid character, was a typical case of neuroparalytic ophthalmia, although other factors, such as the insufficient covering of the bulbus, the diminished nictation, and slight injuries were also helpful in the production of the corneal changes, but the stationary character of the process,

which neither improved, nor became worse, points to the supposition, that this affection was due to a disturbance of the trophic nerve fibres.

The writer cites the histories of three other cases where the affection of the cornea was not due to a defect in the conductivity of the nerve fibers, but to the unprotected condition of the cornea, produced by a diminution in the reflex of nictation. There the unprotected cornea formed the locus minoris resistentia, where the cornea became dry, ulcerated, and injured by external agents. These cases may be called keratitis xerotica, traumatica, and mycotica.

Roentgen and Becquerel Rays in Therapy of the Eye.

DARIER, DR. A. (*Medicinisches-Chirurgisches Central Blatt*, Oct. 9, 1903.) 1. In the first case he had to deal with multiple tumors of the eyelids, conjunctiva, face, neck, mediastinum, and some of them even reaching as far as the heart. The speedy growth as well as the microscopical examination showed the malignant nature of these neoplasms. Severe cough combined with choking spasms endangered life. The use of Röntgen rays for a period of fifteen days, with ten sittings of ten minutes duration for each sitting, caused the disappearance of all tumors from the face, and the eyes could be opened normally. The cough and choking spasms also disappeared.

In the following cases the Becquerel rays of radium were used. These rays are identical with the Röntgen rays.

2. The second case was one of severe periorbital neuralgia in a patient suffering from chorioiditis specifica hereditaria. After the use of radium for twenty-four hours the pain disappeared. Antipyrin, quinin, phenacetin, iodide of potash and mercury were previously used without any effect whatsoever.

3. A man suffering from iritis blenorrorhica acuta with severe pain had been treated with atropin, dionin, aspirin, and sodium salicylate with no effect. After the application of radium for a few hours the pain disappeared entirely, and the pupil which had been very narrow previously, notwithstanding the use of atropine and scopolamine, became wider but irregularly so on account of posterior synechiae.

4. 5. 6. In three cases of iridocyclitis produced by traumatic cataract, after a few hours, the pain disappeared, and

the redness diminished. In none of the above five cases did the pain reappear.

7. The application of radium for twenty-four hours in a patient suffering from an old bleeding in the vitreous after a perforation of the sclera, the vitreous became transparent so that the papilla became visible and vision improved from 1/10 to 1/3.

Two cases with detachment of the retina, and one case of keratitis parenchymatosa, did not show any improvement.

The treatment of affections of the margins of the lids. Cases of blepharitis marginalis squamosa, sycosis simplex and ulcerosa have been treated best, besides the ordinary cleansing with soap, with applications of sublimate and oxy-cyanate solutions combined with Pagenstecher's ointment. The use of benzine and hydrogen dioxide is also of great value. Whereas the simple washing with a 0.02 per cent. sublimate solution has a very slight antiseptic effect on the eye, the application of cotton pledgets saturated with that solution when applied for hours has a considerable effect as a disinfectant.

Some ophthalmologists consider epilation besides the medical treatment as very important. The author states he could dispense entirely with that method since he has been, using benzine H_2O_2 solutions. It is quite surprising to see how easily a pledget of cotton saturated with a few drops of benzine is able to remove crusts and scales from the margins of the lids. The burning sensation in the eye produced by the benzine is slight and passes readily after washing with sublimate solutions or the application of yellow ointment. As the removal of crusts and scales with the free exposure of the underlying small ulcers is a *conditio sine qua non* for the treatment, it is necessary for the attending physician himself to cleanse the eyelids at least once a day with benzine and then apply the yellow ointment. In obstinate cases it is advisable to smear the yellow ointment on a piece of borated gauze, and to apply it on the eyelids before the patient goes to bed. It is not advisable to give benzine to a patient for use at home.

Less intense but also very effective is the use of H_2O_2 . The medicinal hydrogen peroxide contains three parts H_2O_2 and is of acid reaction. It may be used in proportion of one to four of water. The hydrogen peroxide introduced by

Merck is free from acids and contains 30 per cent. of H_2O_2 is to be preferred. A 3 per cent. solution of that is equal in its antiseptic properties to 1 per cent. solution of sublimate. In therapy of the eye 0.3—0.5 per cent. solution is to be employed. If such a solution is applied to the margins of the lids affected with sycosis ulcerosa, (the eyes being closed) an acid reacting foam is developed and with a dry cotton pledget the foam as well as the scabs are easily removed. On account of its chemical properties the H_2O_2 solution is very useful in the removal of purulent secretions and blood from the eyelids. Bandages firmly attached by secretions are also very easily loosened by the use of a solution of peroxide of hydrogen.

ABSTRACTS FROM ENGLISH COLONIAL OPHTHALMIC LITERATURE.

BY

FRANK ALLPORT, M. D.,

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Eye Symptoms in Arterio-Sclerosis.

CONNELL, J. C., M. D. (*Canada Lancet*.) Changes in the retinal vessels as a result of arterio-sclerosis are seen with comparative infrequency, but in these cases disturbance of function is not always present, and in the absence of subjective eye symptoms many cases escape observation. When vision is affected the reduction varies from slight fogginess to complete binocular blindness. The ophthalmoscope changes are: (1) Pulsation of arteries and veins; (2) tortuosity and attenuation of vessels; (3) white streaks along the margin of large vessels; (4) hemorrhages; (5), rarely, beaded appearance of smaller vessels. The joint (3) formation of white streaks along the margin of large vessels is pathognomonic of senile arterio-sclerosis. The most common form of abnormal pulsation resembles a rhythmic wave beginning at the papilla and spreading out over the retina.

Tortuosity and hemorrhage occur at the point where vein and artery cross. Consequent upon the alterations in the arteries and upon the hemorrhages are degenerate changes, such as fatty degeneration of nerve fibers, infiltration with round cells and separation of fibers by hyaline fibroid material, and as a result, loss of vision.

Extraction of Cataract in the Government Ophthalmic Hospital at Madras.

POPE, L. H. (*Indian Medical Gazette*, Vol. 38, No. 9.) This is an addition to the author's paper of 1901. In the removal of the lens, especially from the left eye, he finds that the pressure in the upper lip of the incision is better effected by the tip of the index finger than by any instrument. After operation he uses no bandage, simply an eye shade over both eyes; the patient by raising the head a little can easily

see from underneath the shade. After completing the operation a few drops of a solution of glycerine in water (5 per cent.) are instilled, or the section dusted with idoform, and the patient is led to the ward. The author gives a detailed history of twelve cases, and a table showing a total of 1,235 cases with 82 failures, of which 1,207 were natives, some of whom on account of caste would not remain in the hospital, but were treated as out-patients, coming daily to be treated.

The Size of the Pupil as an Aid to Diagnosis.

DUNCAN, J. T., M. D. (*Canada Lancet*.) The author points out the value of the pupil as a help in differential diagnosis in such cases as locomotor ataxia and uremic poisoning, meningitis, tobacco amblyopia, occupation myosis, apoplectic effusion, epileptic fits, opium poisoning, and intracranial tumors. That the points to be noted may be placed in six classes: (1) Pupils contracted and fixed; (2), pupils contracted and movable; (3) evenly dilated and fixed, or (4) movable; (5) uneven but fixed or (6) movable. That in every case of abnormality of the pupils it is the duty of the physician to examine for signs of locomotor ataxia.

Toxic Amblyopia Caused by Methyl Alcohol.

BULLER, FRANK, M. D. (*Montreal Med. Journal*, January, 1904.) The author cites three cases. The most characteristic symptom is the rapid failure of sight, often becoming complete, but returning again for a time and soon relapsing. Contracted visual fields are the rule as well as central scotoma; the ocular disturbance is usually symmetrical and the blindness often total, for a time at least. Great variations in visual acuity occur before the conditions settle down into progressive and permanent atrophy. The ophthalmoscopic signs are variable. Blurring of the edges of the disc, and in some cases cloudiness of the retina; positive optic neuritis and complete atrophy without signs of antecedent inflammation are the more important changes observed.

As to pathogenesis, the early and often complete loss of vision is regarded as positive proof of profound disturbance in the optic nerves, and the subsequent rapid alterations in the vision without visible ophthalmoscopic changes in the fundus seem to point in the same direction

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

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Optical Treatment of Myopia.

RAMES, Mexico, (*Anales de Optalmologia*, November, 1903), discussed at the first annual meeting of the Mexican Ophthalmological Society, March, 1903, the treatment of myopia by lenses. He asserts that myopia is a pathologic, not alone a dioptric condition, and divides it into three grades:

(1). Low myopia (stationary, practically physiologic); (2) showing slight anatomic and structural lesions but lacking a decided tendency to progress; (3) accompanied by severe and material lesions, by functional disturbances and by a tendency to increase so that vision may be finally greatly impaired or lost. Heredity, race and occupation show their influences on myopia. In the native Mexican race, myopia is rare, only 0.33 per cent., while in the mixed classes it increased to 4.40 per cent. In the higher schools (mixed breed) 19 per cent. In the treatment of the first grade, hygiene and glasses are alone necessary; of the second grade, the cornea and lens need attention and glasses must be very carefully prescribed for the proper axes. Where there are anatomic changes, muscae volitantes, and imperfect vision after correction, the glasses must be carefully changed to meet changing conditions and hygiene must be very emphatically controlled. Treatment of the third grade must be both optical and medicinal, but may be surgical.

In the prescription of lenses for young children, complete accord has not yet been reached. In France, Javal is sparing in ordering lenses for constant use, allowing them chiefly for distance, and then not full correction. In the United States especially, full correction and constant use is attempt-

ed. Ramos for children, tries full correction constantly and finds that these patients accept it, but adults—uncorrected in childhood—will not accept full correction. Each case must be studied by itself; some adults prefer three strengths of lenses. Refraction should be estimated under a cycloplegic, but the prescription given without it. Ramos likes to keep the eye at rest 24 hours or more, and he sometimes succeeds in educating an eye by degrees to accept a strong lens.

Cyst of the Conjunctiva With Secondary Tubercular Infiltration.

OBARRIO, San Salvador, (*Anales de Optalmologia*, November, 1903), reports the case of a female patient of 25, field laborer of good general health. At the second month of infancy the parents noticed a growth at the external angle of the left eye which, however, was never swollen nor painful. This had never been treated. For the last four years this had grown rapidly and now presented itself as a large conjunctival cyst filling the external area of the conjunctival sac; there was a fold extending over the cornea. The walls were smooth, translucent and marked by a few depressions. The lids could be easily closed over the tumor. The eyeball was turned slightly inward, and movement outward was impeded. There was no connection with the lacrimal gland. The walls were thick and tense, but the clear, fluctuating fluid beneath could be seen. Some of the fluid was removed by syringe and the cyst extirpated, there being quite a solid mass at the bottom of the wound. This was examined histologically; there was some glanular (mucous) elements, and signs in parts of the tissues of chronic inflammation. There were discovered giant cells, and tissue elements manifesting the characteristics of tubercle, and the diagnosis becomes therefore a tuberculoma.

Surgical Treatment of High Myopia.

ALONSO, San Luis Potosi, (*Anales de Optalmologia*, December, 1903). continued the discussion of myopia, confining himself to its surgical aspects. Destruction or removal of the lens, called by Donder "rash and criminal" was now, thanks to asepsis, revived. He presents the study in four parts:

- (1) Indications for the operation; (2) preliminary steps; (3) results of operation; (4) personal statistics.

The indications concern age, degree and progression of myopia, visual acuity, heredity, social position, occupation. A visual acuity of 1/10 or less, high myopia (above 15 D) are conservative restrictions. Contraindications are good vision, tolerance of lenses, pathologic fundus and vitreous changes, and loss of the other eye.

Alonso follows Fukula and Pflüger in making dissection with subsequent extraction. The secondary cataract he rather prefers to attack by the scissors.

He reports four cases from his own practice: (1) Woman of 20. Relative emmetropia with $V = 1/4$ instead of $V = 1/10$ with — 20. D.

(2) Youth of 15. $V = 1/6$ with — 14. D. \odot — 20 D. c. axis 180. Result was $V = 1/3$ with $\times 3$. D.

(3) Woman of 32. $V = 1/6$ with — 20. D. After operation $V = 1/3$ with — 2. D.

(4) Girl of 15. $V = 1/6$ with — 16. D. After operation emmetropia, $V = 1/4$.

Treatment of Sympathetic Ophthalmia by Subconjunctival Injections beneath the Stump of the Enucleated Eye.

VELEZ and GRAUS, Mexico (*Anales de Optalmologia*, December, 1903), analyze the conditions that produce sympathetic ophthalmia, and give two cases in which they attempted to abort the affection of the sympathizing eye by injecting 1 grain of a 1:1000 solution of cyanide of mercury with 1:100 of cocaine.

Case I. Male 35, 15 years of age injured in the right eye, which became blind and was enucleated 3 years ago. The left eye showed sympathetic symptoms, the old stump was not painful. Treatment by mercury, iodide and pilocarpine for a month was of no avail. After one injection, vision improved for a while and then sank again. After seven injections at various intervals, the eye became quiet, vision rose to 9/10 with — 10 D. and so remained.

Case II. Male 29, whose right eye six years ago became inflamed and finally atrophied. The left eye three years ago showed all the signs of sympathy with $V = 0.1$. The right eye was now enucleated but eleven days thereafter the left eye again became inflamed, with blood in the anterior cham-

ber. Injections (as above) were immediately practiced, the blood disappeared. The injections were continued, with slight recurrences of hypopyon or hyphema. Atropine was poorly tolerated and was therefore omitted. V became 0.3. This eye was not well, but the injections were undoubtedly of benefit beyond general classical medication which had been tried.

Trachoma in Cuba, Statistically Considered.

SANTOS, FERNANDEZ, Havana (*Anales de Optalmologia*, January, 1904), attempts to show that trachoma is not so rare in Cuba as has been supposed, nor is it altogether exotic. In Mexico, Chacon found 200 cases in 14,000 patients. Santos Fernandez has found during 28 years in 36,242 eye cases, 1181 with granulations; of these 205 were demonstrably foreign. Among whites there were 5.39 per cent. affected, of natives 2.64 per cent., of negroes 0.84 per cent., of the mixed race 1.26 per cent. The proportion among Turks and Syrians 30.43 per cent., and Chinese 8.46 per cent., who came to Cuba as immigrants, is naturally large.

As a rule the sentence of Enrique Lopez may be quoted: "Trachoma seems to be less severe in Cuba than in Europe, or at least I have not seen among us those complications that in other countries so frequently occasion blindness."

Congenital Word Blindness of Nettleship. (Inability to Learn to Read.)

WERNICKE, Buenos Ayres (*Anales de Optalmologia*, January 1904), reports two cases of this condition, adding them to Morgan's observation (British Medical Journal, 1896), Hinselwood, Nettleship, etc. He thinks the condition not so rare as might be supposed and that it is not alone a lack of intelligence but a cerebral defect, and that children must therefore be carefully studied to determine what is stupidity and what is congenital word blindness. The eyes are not at fault.

Case I. Girl of 19 about to be married, who could not learn to read. Somewhat hysterical. V = $\frac{5}{4}$ both eyes, and eyes normal. Manifest Hy + 1.50 D. Accommodation normal, but glasses not used.

Case II. Boy of 10. Father alcoholic, brother imbecile, of poor general health. Seemed to be of normal intelligence,

and good observing powers. Could not learn to read. $V = 5/4$ O.a. normal accommodation, normal eye grounds. Knew his letters but made mistakes, although he read figures and had no trouble with objects and characters. Could read musical notes. He could repeat words and phrases and his memory was good.

The defect must have been central, because the transmitting tissues and other functions were normal.

In some of these cases there have been family imperfections, but in others the history has been good. The lesion cannot be in the visual center of the occipital lobe for then it would be necessary to admit a bilateral, symmetrical center. He supposes the lesion must lie in the left angular gyrus.

Treatment must be methodic and appropriate training for each case, best apart from normal children.

Floating Vesicle in the Vitreous.

URIBE TRONCOSO, Mexico (*Anales de Optalmologia*, January, 1904), reports a vesicle in the vitreous which he thinks is extremely rare. Miss F., 15, for seven years had failing vision. Three years ago the right eye began to deviate outward. There had never been pain and her general health was good.

O.D. was myopic — 9.0 Ds \ominus — 1.50 D x 70°
O.S. " " — 4.5 Ds \ominus — 2.50 D x 15°

In the left eye, behind the lens, there was seen an ovoid vesicle, semitransparent above, but black below. It was movable and had about the same density as the vitreous but was somewhat heavier. Pupil and iris were normal, fundus normal with deep physiologic excavation and no trace of persistent hyaloid artery. It had no body, so could not have been a hydatid. Uribe's idea is that it represented a cyst from the uveal tract.

Neuroma of the Optic Nerve.

DEHOQUES, Havana (*Archivas de Optalmologia*, December, 1903), has an interesting example in a child of 12 years, of a neuroma which had been first observed eight months ago. There was extreme exophthalmos but no pain. There was still some movement. A growth could be detected behind

the globe. There was optic atrophy and vision was lost. The eye was enucleated when the tumor was discovered to be part of the optic nerve and its histologic characteristics of a neuroma composed exclusively of nerve fiber of Remak. The reporter thinks this tumor must have been congenital.

Quinine Intoxication with Grave and Permanent Ocular Lesions.

MARTINEZ, Madrid (*Archives de Optalmologia*, November, 1903), reports the case of a man of 30 who on the 28th of October, 1902, took by mistake in place of 30 grams of sulfate of magnesia, 30 of the sulfate of quinine. He supposes, however, that he received only 20 grams; after a few minutes he felt some epigastric distress with vertigo and then lost consciousness. He was three days in hospital unconscious, but on recovering there was severe cephalalgia, roaring in the ears and complete blindness. Hearing returned, the headache grew less, but the blindness continued complete for 56 days. His health was good except for slight digestive disturbances. On January 5, 1903, his vision in each eye was $1/3$. The visual field in both eyes was much restricted and there was complete color blindness. The tissues were normal except for advanced white optic atrophy.

ABSTRACTS FROM GERMAN OPHTHALMIC
LITERATURE.

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On Ocular Affections in Anchylostomiasis and Its Treatment.

NIEDEN, Bochum. (*D. M. Woch. V. B.*, 1903, p. 353.)
Ocular affections in anchylostomiasis are observed in about seven to eight per cent. of the cases. The intense pallor of arteries and veins and diminished contents of the former, occasional pulsation with normal or even decreased intraocular pressure, tortuosity of the veins and porcelain color of the disc, as in dead eyes, are not as characteristic as the hemorrhages of the fundus similar to those in pernicious anemia. They appear in streaks, isolated patches or in broad foci along the vessels, with more or less signs of fatty degeneration. Changes at the macula, peculiar to retinitis albuminuria, are rarely encountered. Sclerotic and fatty degeneration of the endothelium is found microscopically, as in pernicious anemia caused by bothriocephalus. Vision is more or less impaired and associated with contraction of the visual field, anesthesia of the retina, accommodative and muscular asthenopia, diplopia, vertigo and tendency to nystagmus of miners. The disturbances are probably due, not only to the loss of blood, but also to toxins produced by the hook worms.

The only effectual remedy is ext. filicis naris rec. par. 3.00 to 10.00, given repeatedly, but it may cause intoxications.

especially of the visual organ. Visual disturbances were observed in 67 out of 81 cases of intoxication (58.3 per cent.), i. e., periodic or chronic amblyopia and amaurosis. In experiments on animals it was observed in 35.7 per cent. Nieden saw total blindness in three out of 3,686 cases of his own observation. After recovery from the severe somnolence the eyes show the following symptoms: Pupils wide, do not react, blood vessels narrow as threads, optic disc shows whitish or greenish discoloration with general opacity of the retina, especially at macula, similar as in intoxication by chinine. There must be undoubtedly an individual idiosyncrasy, and the remedy requires especial precaution in very anemic and weakened patients. A similar toxic amblyopia has been observed after taking extractum granatum.

On Siderosis Retinae et Bulbi.

UHTHOFF, W., Breslau. (*D. M. Woch.*, 1903, No. 48.) Uththoff reports four cases of perforating injuries of the globe by pieces of iron, furnishing valuable material for the study of siderosis retinae. They showed impairment of vision, concentric contraction of the visual field and hemeralopia, symptoms met with also in other diffuse processes in the retina leading to atrophy, in which chiefly the outer layers of the retina are affected. In one case there was extensive peripheral pigmentation of the fundus in star-shaped configurations, from proliferation and migration of cells of the pigment layer into the retina, as proven in experimental siderosis retinae. The degeneration and functional disturbances of the retina extend, however, much farther than the ophthalmoscopic changes. The opacities of the vitreous, the discoloration of the iris, changes of the lens and brownish discoloration of the cornea were also due to siderosis, caused by the presence of iron in the eye. With regard to eventual siderosis, the magnet operation has to be considered, according to the peculiarity of the case. The operation must be performed in recent cases, while in those of longer duration with diminished vision and lacking irritation of the globe its dangers must not be disregarded. If the deterioration of sight is progressive as a consequence of siderosis, the extraction of a foreign body, lodged for some time in the eye, will be of no avail, since the quantity of iron, already diffused, very likely will cause further progressive degenera-

tions. Uhthoff's observations confirm the statements of other authors, especially of E. Von Hippel, that certain cells show an affinity to iron, e. g., the epithelium of the ciliary processes, pars ciliaris retinae, retina and capsular epithelium of lens. The muscular fibers of the iris were also intensely impregnated with iron, which may explain the impeded re- of the pupil, which generally is dilated.

A Case of Typical Keratitis Post-Vaccinolosæ.

SCHIRER, PROF. O., Greifswald. (*Deutsch Med. Woch.*, 1903, V. B. No. 51, p. 602.) A woman, aged 40. developed a vaccinola ulcer at the intramarginal portion of the right lower lid through infection from her child who had been recently vaccinated. While the ulcer was healing she complained of disturbance of vision and exhibited the beginning of this rare affection. It commenced with a small central defect of epithelium around which the latter was opaque and somewhat thickened, with slight parenchymatous opacity. The parenchymatous and epithelial opacities increased during the following days, but there never was an ulcer. After week the epithelial defect was filled and the epithelial opacity grew less although it remained speckled for a long time. The parenchymatous opacity now appeared an intensely grey disc in the deeper layers, in which irregular grey streaks and hooks are observed. The disc was surrounded by a saturated grey ring, situated directly before or behind Descemet's membrane. Inoculations from this grey epithelial wall into the cornea of rabbits produced grey infiltrations, and in guinea pigs very extensive chronic parenchymatous keratitis, in concordance with the experiments of Guarnieri. S. considers his observations of principal importance, since keratitis post-vaccinolosæ is the first kind of profound, non ulcerating keratitis, whose endogenous origin is confirmed and the morbid agent is known. Perhaps keratitis disciformis (Fuchs), which is very similar to it, originates in the same way, although we do not know anything about its morbid agent.

Congenital Ectropion of the Pigment Layer of the Iris.

HIRSCHBERG, PROF., Berlin. (*Centralbl. f. Aug.*, 1903, p. 321.) It occurs in three chief types: 1, In forms of little bags, like the anthers of some blossoms, consisting in num-

erous small, roundish excrescences of dark brown, velvety surfaces, at the pupillary margin. In transmitted light the pupillary margin appears like the cog wheel of a watch. 2, The doubled-up pigment layer lines the pupil like a rushing. 3, Like an apron as a broad, dark projecting formation, crossed by shallow radiating furrows, terminating in delicate teeth at the pupil. In artificial dilatation of the pupil it contracts to a narrow seam. H reports 6 cases from his clinic, 2 of which showed the two first forms, and 2 the last one.

On Ocular Affections Caused by Wohlfahrt's Fly.

LOTIN, A W., St. Petersburg. (*Ibidem* p. 328.) L. gives a review of the biology of this fly, *Wohlfahrtia magnifica* Schineri, discovered by Wohlfahrt in 1770, and reports the few cases so far published in which it affected the eyes, and one of his own observation. He proposes the term ophthalmomyiasis for the affection.

L.'s case occurred in a farmer boy, aged three years, who showed hardly perceptible grey points in the conjunctiva of right eye between the medial angle and the caruncle. With a pair of forceps, applied to these points, 10 grey, spindle-shaped worms were extracted, 0.5 cm. long and 1 mm. thick, which had entered the tissues. Applications of sublimate 1:5000 were ordered and the patient was sent home. The microscope showed that the body of the larva consisted of thirteen rings with large black cones, which give the animal a striped appearance. The headring had two large black hooks. The fly is found in Russia, Germany, Austria and Italy, and lives chiefly around the livestock. The infection befalls people, especially children, who sleep out of doors. The animal does not lay eggs but bears fully developed larvae and deposits them in wounds or in the natural openings of the body, rarely in the eyes. Since the larvae eat into the lymphatics and veins they may produce fatal lymphangitis and hemorrhages.

Traumatic Prolapse of the Lacrimal Gland.

PURTSCHER, Klagenfurt. (*ibidem.*, p. 352.) After a review of the literature of this rare affection, Purtscher reports the following two cases: A child, aged two years, showed after an injury on the previous day, a lobulated, yellowish

red, round body, the lacrimal gland, mea uring from right to left 12 mm., from above below 4 mm., projecting out of a 2 cm. long wound, parallel to the upper orbital margin, with exposure of the periosteum. After thorough cleaning, the lacrimal gland was replaced, and the wound sutured, with complete recovery. The second case occurred in an adult, which is very unusual, and was treated in the same way with the same favorable result.

A Case of Bilateral Glioma Retinae.

HIRSBERG, J. (*ibidem*, p. 360.) A child of ten months, the only child of healthy parents, showed a glaring reflex from her right eye when four months old, and three months later also from the left eye, so that the tumors were probably congenital. She came too late for an operation, since only those cases can be saved by an operation, in which the light reflex from the interior has been observed for not more than six, or at the highest, ten weeks.

Subconjunctival Extraction With Formation of a Pocket of the Conjunctiva.

CZERMAK, W., Prag. (*Klin. Monatsbl. für Aug.*, 1903, II, p. 497.) With the edge of a Von Graefe's knife downward, Czermak pierces the conjunctiva, 1 to 1.50 mm. from the temporal limbus, and carries it subconjunctivally to the imbus, enters the anterior chamber as far as the center of the pupil, or performs the contra-puncture at 1 mm. from the limbus. While withdrawing the knife the capsule is opened. (This however, may be done later with the cystitome.) The temporal incision of the conjunctiva is enlarged 1.2 or 1.5 cm. downward in a perpendicular direction, with a firm straight scissors, and the conjunctiva undermined to a line, running parallel to the first incision from the place of contra-puncture, so that a conjunctival pocket is formed. Then the corneal section downward is completed with a Louis scissors and the lens expelled by applying a spatula on the sclera, in the pocket, and another at the upper corneal margin. After the necessary toilet the conjunctival wound is closed by a suture. The complete covering of the corneal wound by conjunctiva prevents secondary infection, and, to obviate primary infection, Czermak is very careful never to use an instrument again after it has once touched the surface of the

eyeball. The different types of the operation are illustrated by drawings. For further particulars Czermak refers to his book on the "Operations on the Eye," which we reviewed under the book notices of this number of the ANNALS.

The Conditions of the Muscles of the Iris in Traumatic Paralysis of the Pupil.

LEVINSOHN, G., Berlin. (*ibidem*, p. 515.) Levinsohn reports a few cases with the following resumé: Contusion of the eyeball causes in the great majority of cases traumatic mydriasis; in a few, traumatic miosis. The latter is either a reflex, from irritation of the fifth nerve, or due to paralysis of the dilator with or without injury to the dilator muscle. If the muscle is not injured the paralysis is transient, or it is associated with paresis of the sphincter which outlasts the former. Reversely traumatic mydriasis very frequently is combined with paresis of the dilator, which may be demonstrated by the fact that the pupil enlarged by daylight remains smaller than the healthy pupil on shading. The paralysis of the dilator in traumatic mydriasis is not as intense and subsides earlier than the paralysis of the sphincter. The latter is the chief element in traumatic mydriasis, which is influenced only in a small degree by the slight lacerations of the sphincter. The paralysis of the sphincter gradually decreases and frequently disappears entirely. The changes of the form of the pupil, however, caused by injury of the tissues, mydriasis as well as miosis, are permanent.

Unilateral Spontaneous Polycoria Produced by Atrophy Without Mechanical Stretching.

HARMS, C., Tübingen. (*ibidem*, p. 522.) In the left iris of a healthy man, aged 43, two large coloboma like dehiscences formed in the course of 10 years without known cause. Tension increased, there was arterial pulsation and numerous fine brown deposits on Descemet's membrane appeared. The latter suggested a chronic iridocyclitis, and to this Harms attributes the atrophy of the iris and the glaucomatous tension. He quotes a case of Bentzen and Leper in which the hole in the iris was ascribed to atrophy of the iris in consequence of glaucoma.

Re-attachment of the Detached Retina.

LANGE, O., Braunschweig. (*ibidem*, p. 528.) Lange ob-

served in three eyes re-attachment of the detached retina after rapid development of cataract. Probably the increase of volume of the swelling cataractous lens played an important part by raising the intraocular pressure to the normal degree.

Subconjunctival Injections of Alcohol.

PESCHEL, MAX, Frankfurt. (*ibidem*, p. 504.) Since 1896 Peschel treated a number of cases of acute and chronic inflammations with subconjunctival injections of 1 cem. of 15 per cent. alcohol, to which 1 0/00 cocaine was added, and obtained very favorable results in keratitis, ulcers of the cornea, episcleritis, iritis, tenonitis, exudations and hemorrhages of the vitreous, chorioiditis, rheumatic retrobulbar neuritis and sympathetic ophthalmia. In almost all cases other methods of treatment were simultaneously employed, but were temporarily discontinued, so that the action of the alcohol injections could be directly observed.

Development of Membranes on the Anterior Surface of the Iris.

RUMSCHEWITSCH, K., Kiew. (*ibidem*, p. 533.) Although it has been proven that the endothelium of Descemet's membrane may proliferate to several lamellae (endothelogenous tissue, Wagenmann) and spread over the iris, the histological examination of two cases of Rumschewitsch, which are given in extenso, show that also the endothelium of the anterior surface of the iris may produce hyaloid membranes or connective tissue of peculiar lamellar structure.

The Light Reflex of the Retinal Arteries of the Human Eye.

ELSCHNIG, PROF., Wien. (*ibidem*, 1904, I, p. 37.) So far, Dimmer's theory was generally accepted, viz.: that the reflex of the retinal arteries originates at the anterior surface of the axial current and that of the veins at the anterior surface of the blood column. Elschmig, however, observed that the light reflex almost retains its width, color and intensity, if by pressure on the eyeball with the finger, the whole blood current of the arteries is excluded. Pathological changes of the retinal vessels (sclerosis) also seem to show that the walls of the arteries influence color, intensity and width of the reflex streak. Elschmig considers Dimmer's theory repudiated by these facts.

Left-Sided Homonymous Hemianopia After Intoxication With Carbonic Oxide.

ENSLIN, Breslau. (*ibidem*, p. 39.) There was homonymous left-sided hemianopia for colors. The borders of the visual field for moving white objects (10 sides) were perfectly intact for the temporal half of the left eye, but on the right eye there was a sector-shaped defect from 60° of the nasal half to the fixation point. At first the optic memory was disturbed. The symmetry of the hemianopic defects suggested a cortical lesion, caused as usually in these intoxications, by small hemorrhages.

Abrasion of Maculae of the Cornea.

HOLSTRÖM, J., Malmö. (*ibidem*, p., 43.) Hülstrom, obtained favorable results from abrasion with a sharp spoon in 20 cases of diffuse, superficial maculae with irregular, uneven surfaces. The object of the operation is not only to remove the opacities, but chiefly to correct the unevenness which causes chiefly the impairment of sight.

On Müller's Trachoma Bacillus and Conjunctivitis, Caused by the Influenza-Bacillus.

ZUR NEDDEN, Bonn. (*ibidem*, p. 47.) The author refutes the assertion of Müller that Müller's bacillus found in numerous cases of granular conjunctivitis and being identical with the influenza bacillus, be the morbid agent of trachoma. He rather thinks that in those cases of trachoma, in which Müller found this bacillus, influenza conjunctivitis was simply superimposed to trachoma. This explains the identity with the influenza bacillus.

Experimental Investigations on the Detrimental Influence of Powdered Aniline Colors on the Conjunctiva of the Rabbit.

GRAEFLIN, ARTHUR, Basel. (From the Clinic of Prof. Melinger. *Zeitsch. f. Aug.*, X. 3 p. 193.) G's experimental results were in concordance with the clinical observations on 77 cases, from 1890 to 1901, of which 36 showed keratitis, 41 conjunctivitis. One group of the aniline colors was injurious, the other not. The first are mineral salts, soluble in water, which are dissociated in the ocular fluids, viz.: the liberated soluble acid is constantly washed off by the tears,

whereas the remaining, almost insoluble, base irritates the conjunctiva and the cornea. These colors were crystal violet, victoria blue, malachite green, prune, safranine, auramine rhodamine, methylene-blue. The uninjurious group consists of neutral salts of acid colors, viz.: congo, tartrazin, direct blue, direct black, eosine, water-blue. 15 experiments and 10 clinical histories are reported.

On Intraocular Iodoform Disinfection, Especially the Introduction of Iodoform Into the Vitreous Body.

DINNER, J., Glarus. (*Inaug. Dissert.* from the Eye Clinic of Prof. Haab, Zürich, 1903.) D. reports in detail 25 cases treated, within the last two years, with iodoform. Of these 16 were cases of foreign bodies in the globe or perforations of the eyeball, of which 12 were treated with introduction of iodoform into the anterior chamber, 4 with introduction into the vitreous, 3 showed postoperative infections, 3 tuberculous (sero-plastic) iritis, 3 serpent ulcers of the cornea (hypopyon.) The study of these 25 new cases corroborated H.'s favorable views of the intraocular disinfection with iodoform. In 13, out of the first group of 16, the eyes were preserved. The three cases of postoperative infections, took a favorable course. Introduction of iodoform into the anterior chamber in the 3 cases of serpent ulcer prevented spreading into the deeper part of the globe, but a prompt action on the suppuration is less frequently observed. The author concludes with the remark, that the intraocular application of iodoform must be regarded as one of the most important therapeutic progresses in modern ophthalmology. The iodoform rods and tablets, manufactured by Dr. Sidler-Huguenin may be obtained from the Apotheke zur Post, Kreuzplatz, Zürich V.

Panophthalmia Bacilli in Injuries by Pieces of Harrows.

HAAB, Prof. O., Zurich. (*Correspondenz-Blatt für Schweizer Aerzte*, 1903, Nos. 20, 21, and 22.) Most of these injuries occur in the territory of Jura-Kalk formation, which is very rocky and in which the bacilli were found abundantly by Dr. Silberschmidt. H's examinations of harrows, used in that region, revealed that from insufficient hardening, pieces break off very readily without much force. Therefore they need not be glowing when striking the eye and very likely

carry the bacilli into the vitreous. H. always found the bacilli in the immediate neighborhood of the foreign bodies. Unfortunately they are much less influenced by iodoform than other pus germs. In all these cases of injuries by pieces of iron it is of the greatest importance to apply at once the giant magnet.

Infantile Glaucoma.

HAAB, Prof. O. (*Ibidem*). H. advocates sclerotomy as early as possible in infantile glaucoma. He performed 104 sclerotomies on 38 such eyes, from 1881 to 1899, with very satisfactory results.

On the Dilator Pupillae.

HAAB, O. (*Ibidem*.) The existence of the dilator pupillae could be proved with certainty after a method was found by which the pigment of the posterior surface of the iris could be carefully removed, without damaging the fine muscular fibers, lying in front of it and in it. H. demonstrated specimens, prepared by Dr. Verhoeff of Boston, according to the bleaching method of Alfieri, with hypermanganate of potash and oxalic acid.

Tuberculin-injections in Eye Affections.

HAAB, O. (*Ibidem*.) H. reports 21 cases. Of especial value are the local reactions on the eye. These were positive in 4 cases of chorioiditis, 2 cases of tuberculous conjunctivitis, a case of serous plastic iritis, 2 cases of nodular iritis, and a case of papillitis and a case of severe eczema of the cornea with enlarged cervical glands. The cases of chorioiditis with local and general reactions are of particular interest, as they are apt to throw clearer light on these affections, especially on disseminated chorioiditis. In a case of obstinate iritis, which was under treatment for three-quarters of a year, the (old) tuberculin injections finally disclosed, by characteristic febrile reactions, the so far unknown etiology. From his experience with a series of diagnostic injections of tuberculin, H. considers the latter indicated in ocular affections of dubious origin, in which it is not clear whether they are caused by lues, rheumatism, chronic gonorrhea, tuberculosis, etc.

Eumydrine.

HAAB, O. (*Ibidem*.) H. corroborates the assertion of Dr.

Roelig, who introduced Eumydrin, the nitrate of the methyl-ammonium base of atropine, that it is less poisonous than atropine and hyosine, after having used 2 per cent. solutions on a great number of patients for about a year.

Puerperal Metastases in Chorioid and Retina.

HAAB, O. (*Ibidem.*) H. demonstrated specimens of streptococcus metastases in the chorioidal and retinal vessels of a woman who died of puerperal sepsis. In some chorioidal vessels the streptococci formed a regular plug, filling the whole lumen. The central retinal vein showed a recent thrombosis at the region of the lamina cribrosa.

On Family Macular Degeneration of the Cornea.

FEHR, (From the eye clinic of Prof. Hirschberg, Berlin. *Centralblatt für Aug.*, 1904, p. 1.) In two sisters and a brother, all being healthy, without known cause a progressive opacity of the cornea of both eyes, with corresponding deterioration of sight, developed from the 10th or 12th years of age, and led, after about 30 years, to disability for work. Aside from the visual disturbances, slight irritability, and photophobia, there are no subjective ailments. The cornea shows a diffuse grey opacity, intermingled with whitish dots and maculae. On examination with the magnifying lens the diffuse opacity consists of very fine chagrin dots. The opacity is densest in the center and occupies chiefly the superficial layers, whereas, at the periphery, the deeper lamellae are affected. It is not preceded by nor associated with inflammatory symptoms to speak of. There are no vascularizations of the cornea nor complications in the iris or deeper parts. The corneal surface is perfectly even, smooth and reflects light normally, with preservation of sensibility. The etiology is obscure and treatment useless.

F. considers this rare affection as an intermediate form between the nodular and lattice shaped opacities of the cornea, described by Haab, Dimmer, Freund, Groenouw and Fuchs. Dimmer, who observed the nodular opacities in three children of the same family, found in the excised corneal tissue hyaline and colloid degeneration with crystals of triple phosphates. There is only one case, published by Koerber, perhaps identical with F's cases.

Ulcers of the Lid Covered with Moulds.

ROSENSTEIN. (From the eye clinic of Prof. Hirschberg, *Ibidem*, p. 14.) An ulcer on the lower lid of a farmer, aged 17, developed two weeks previously from a small white blister. It was of the size of a bean, crater-shaped, absolutely dry, covered with a thick whitish brittle mass, as if dusted over by iodoform, without any irritation or sensitiveness to pressure. Microscopically this mass contained mycoderma cells, several forms of sarcine and a mucor species. The cultures, however, were negative. Thorough cauterization with the Paquelin cured the affection in two weeks, without any cicatricial retraction. This case appears to be unique, as an ulcer of the lid, infected by mycoderma cells, has not yet been described.

Further Remarks on Deutschmann's Method of Treating Detachment of the Retina.

DEUTSCHMANN, PROF. R., Hamburg. (*Beitrage zur Augenheilkunde*, Heft 59.) From very numerous trials with subconjunctival injections of weak salt solutions D. saw only a transient effect in recent cases of detachment of the retina, but never a reattachment, and never even a transient result in older cases. In referring to the exposition of his method in his former publications in 1895 and 1899 (Heft 20 and 40) a reattachment of a separated retina is only possible under the following conditions: 1, removal of the subretinal fluid; 2, its replacement by pre-retinal fluid, to keep the retina pressed against the chorioid; 3, excluding continuous traction from the equatorial region through inflammatory processes by perforating the stretched retina; 4, cutting of bands, connecting retina and vitreous body. This, of course, cannot be attained by subconjunctival injections. D. saw, out of 300 cases, only 2 or 3 which healed under non-operative treatment, but the time of observation was scarcely a year.

D. has operated, by his method of cutting the retina and injecting the vitreous body of rabbits, on 185 eyes with 23 to 26 per cent. recoveries. Although he saw relapses in rare exceptions, he does not deny their occurrence as no term can be given from which on, a reattachment will be lasting. The longest periods of his observations of cured cases were 13 years after his incisions, and 10 years after the injections

of vitreous body. His canula has been changed to a double edged canula knife and, instead of vitreous body of rabbits, injection fluid from the vitreous of the calf may be used, prepared by Dr. W. Mielck of Hamburg, from whom it may be obtained in glass tubes, the canula knife from Mahrt & Hörning of Goettingen. D. wishes, by his renewed recommendations of his method, based on his encouraging results, to interest other ophthalmologists to co-operate with him in further improving this mode of treatment of an otherwise hopeless affection. For further particulars we must refer the reader to the original.

Lattice-Like Corneal Opacities.

FREUND, H., Röhman, (*Graefes Arch.*, LVII H. 2), gives the following characteristics of the affection described as "lattice-like corneal opacities." It is an hereditary disease making its appearance first at the age of puberty. It is recognizable by gray superficially placed specs lying beneath the epithelium in and about the center of the cornea, and giving a coarse unevenness to the surface of the cornea. Though the diffused corneal opacities which under the loup resolve into a lattice-like net work, which, especially in the beginning, exhibits radiary matweed-like linear opacities. The periphery of the cornea remains clear throughout the disease.

Tumor of the Optic Nerve Operated Upon by the Kronlein Method.

SCHMIDT-RIMPLER (*Die Ophth. Klinik.*, VIII 20) performed the operation upon a child 5 years of age. The eye was proptosed forward, upward and outward 12 mm. The outward and downward movements were limited. V. = small objects at 1 1/2 m. The papilla was congested and a wall of edema surrounded its margin. The blood vessels were congested. The pupil reacted well. With a probe inserted within a conjunctival incision an enlargement could be felt within the muscle funnel. Three mm. of the nerve was excised. The egg shape of the tumor, which was 1 cm. in breadth, was caused by infiltration of the intervaginal space and the inner sheath. From the middle of the tumor (from which point outward a particularly intense cell invasion could be followed into the nerve) the intervaginal growth

was especially broad and developed, and formed a firm union between the nerve and the dural sheath. In other parts this sheath was separated from the nerve by a free space, but nowhere was the dural sheath involved, it acting as a barrier to the spread of the neoplasm. Microscopically the growth was a myxosarcoma. The optic nerve fibers while infiltrated and thickened were well formed so that the origin of the growth must have been from the trabeculae of the intervaginal space.

Pus formed in the orbit and drainage was required. One year later the motor apparatus was normal except that in and down the movements were slightly limited. The pupil was medium sized and reacted slightly to accommodation and convergence. At the posterior pole of the fundus and in the region of the papilla (which as such could not be distinguished) there was a white avascular plaque with black streaks, points and dots. The periphery was more nearly normal but was unduly pigmented. Temperature was about normal.

Discission of Juvenile Cataract.

HAAS (*Woch. f. Therap. u. Hyg. f. Aug.*, VII. 17) states that as the result of improved technique and instruments, the dangers connected with the discission of juvenile and secondary cataracts has been greatly diminished. The first has been accomplished by the conjunctival method. For the proper performance of this operation the patient is so placed that the operator may stand behind and have the eye to be operated upon at reading distance without uncomfortably bending over. A spring speculum is inserted and the eyeball fixed, by suitable forceps, at the vertical meridian and the patient directed to look to the nasal side; as a result the temporal conjunctiva is put upon the stretch. The needle is then entered as far peripherally as possible through the conjunctiva at the sclero corneal margin (the puncture canal lies for the most part within the sclera) parallel to the plane of the iris, and passes close to this into the anterior chamber. The patient now looks directly forward and the needle is carried to the middle of the pupil and then upward to the point on the capsule where the incision is to begin. A slight elevation of the handle of the needle without pressure sinks the point into the anterior

cortex where it is made to describe an arc of a small circle having for its centre the point of puncture and for its radius the length of the needle within the anterior chamber. In this way the incision can be kept within the peripheral layers of the lens. On the withdrawal of the needle the puncture canal closes as a valve and not a drop of aqueous is lost. The relation of the conjunctival and scleral punctures is now changed so that the scleral wound is entirely subconjunctival and is consequently protected against infection. In operating under general anesthesia or on very young children the eyeball is fixed in the horizontal meridian in order that inward rotation may be accomplished by the operator. The author prefers Pagenstecher's needle which is slender and delicate and terminates in a very slightly broadened long lance-shaped knife. For illumination he prefers a small dry cell electric light attached to a head band. He is sufficiently convinced of the harmlessness and safety of this method as to treat the case as an outdoor one.

The Preparation and Employment of Yellow Salve.

KNAPP, B., (Wien. Klin. Woch. 1903, 50. *Abst. Woch. f. Therap. u. Hyg. des Auges*, 1903, 13), believes that the cause of the discrediting of Pagenstecher's salve, at times, is due to its faulty preparation whereby particles of the metallic oxide are introduced within the conjunctival sac. According to K. the ointment should be prepared after the method suggested by Schweissinger, which is as follows:

Freshly precipitated mercuric oxide is washed with water until the chloride reaction disappears; it is then dehydrated by 90 per cent. alcohol and freed from the latter by spiritus etherus, and finally washed with ether. To this ether saturated precipitate is added an equal part of vaseline, and the whole heated to drive off the ether; enough vaseline is now added to make a 10 per cent. salve. This is stable and from it an ointment of any strength can be made by the addition of sufficient vaseline. In the treatment of trachomatous pannus the author has seen excellent results follow the use of the 10 per cent. salve. The salve is rubbed thoroughly into the conjunctiva of the everted lids until the membrane begins to bleed. Frequently the pannus is absorbed in from 4 to 6 weeks.

Infantile and Juvenile Tabes.

MARBURG, WIEN, (Wien. Klin. Woch. 1903, 47 *Abst. Woch. f. Therap. u. Hyg. des Auges*, VII-15), records a case of tabes occurring in a ten year old boy who had been infected, through his wet nurse, with the syphilis. There was beginning optic atrophy with Argyll-Robertson pupils and indications of Romberg's and Westphal's phenomena. The author has analyzed 34 cases of this affection found in literature. Of these, 19 occurred in females and 15 in males. In 22 there was hereditary syphilis and in 4, acquired, showing syphilis to be of the greatest significance in the etiology of this disease. A neuropathic disposition and depression following infectious disease are predisposing causes. Disturbances of sensibility were present in 24 cases. Accompanying disease of the optic nerve is frequent and influences the course and character of the spinal affection. Bladder disturbances are frequent. The prognosis, *quoad vitam*, is good.

Operative Treatment of Ulcus Serpens.

SCHULTE, Fulda. (*The Ophth. Klinik*, VIII, No. 1.) Owing to the serious disadvantages of the present operative methods of treatment of ulcus serpens, i. e., that in the Saemisch method a large adherent leucoma results, and by the use, of the galvano-cautery the destruction must extend into sound tissue with a resulting cicatrix larger than the ulcer, Schulte has used "punctiform galvano cauterization within the ulcerated area." A needle with the finest possible point is used with which to make a minute hole in the floor of the ulcer so that the aqueous humor drains off. Small hypopyon requires no further treatment as the pus will flow off through the hole. Should the collection be large and but slowly absorbed, i. e., fibrinous, the anterior chamber is perforated below at the sclero-corneal junction and upon reformation of the chamber, perforation of the ulcer is resumed. Should the opening become plugged with exudate it is reopened twice daily with a spud. In but two cases has the author had sequelae; in one, a fine anterior synechia, in the other, a faint deposit on the anterior capsule of the lens.

The Ocular Symptoms of Multiple Sclerosis.

KAMPHERSTEIN, Breslau (*Arch. F. Augenheilk.* XLIXB. H. 1) gives the following summary of the ocular conditions

found in multiple sclerosis (in all about 150 cases) occurring in the practice of Uhthoff, Lübbers and his own:

1. Pronounced optic atrophy: 4 times (3 times bilateral, once unilateral).
2. Incomplete atrophic discoloration of the entire papilla, i. e., the inner portion still showed traces of capillarity: 28 times (12 times bilateral, 16 times unilateral).
3. Temporal pallor: 41 times (16 times bilateral, 25 times monolateral).
4. Optic neuritis: 9 times (5 times bilateral, 4 times monolateral).
5. Ophthalmoscopic normal appearances with disturbances of vision: 7 times.

II. ANOMALIES OF THE VISUAL FIELDS.

1. Central scotoma with normal form fields.
 - a. Absolute: 9 times (5 times bilateral, 4 times monolateral).
 - b. Relative: 20 times (14 times bilateral, 6 times monolateral).
2. Central scotoma with simultaneous contraction: 6 times (2 times bilateral, 4 times monolateral).
3. Peripheral contraction, more irregular in cases with relatively intact central vision: 12 times (9 times bilateral, 3 times monolateral).
4. Regular functional contraction: once.
5. Colors not recognized in any portion of the visual field: twice.

III. MUSCULAR PALSIES.

1. Paresis of the abducens: 14 times (5 times bilateral, 9 times monolateral).
2. Oculomotor palsy: 9 times.
3. Associated palsies: 11 times (10 times lateral movements, and once upward with limitation in the remaining directions).
4. Paresis of convergence.
5. Ophthalmoplegia externa.

IV. NYSTAGMUS.

1. Nystagmus: 22 times.
2. Nystagmic twitching: 81 times.

V. PUPILLARY CONDITIONS.

1. Immobility to light reflex with myosis: once, bilateral.
2. Immobility to light reflex with mydriasis: once, unilateral.
3. Marked diminution of light reflex without myosis; 3 times.
4. Marked difference in size of pupil: 6 times (4 times diminished light reaction).
5. Reaction to convergence very slight with relatively good light reaction: twice (both times associated with insufficient convergence).

The Use of Complementary Colored Mires in the Ophthalmometer.

STREIT (*Arch. f. Augenheilk.*, XLIX B.-H1) suggests the use of complementary colored mires for the Javal-Schiötz ophthalmometer, for example, red and green, as by the use of such a device the dispersion which is produced by the Wollaston prism with white light, does not occur and the resulting prismatic colored borders to the mires is eliminated. As these colors produce white when superimposed, very accurate determination of contact is rendered possible by the appearance of a white line.

Paralysis of Associated Movements

BIELSCHOWKY, Leipzig, (*Munch. Med. Woch.* No. 39, 1903), after reviewing the theories held regarding the localization of the center for associated movements, analyses the case recently reported by Steinert of a girl with the following ocular conditions. O. S., was directed forward; lateral movements impossible, O. D., is directed outward 10° ; outward movement full, inward abolished. The strongest attempts at convergence are attended by only the merest adduction of both eyes. If an attempt is made to fix an object directly in front, she is obliged to turn the head to the left so that the eyes had to be turned to the right in order to fix. O. D. follows the impulse to turn to the right; O. S., however, lags perceptibly. If the maximum right turning impulse follows the maximum convergence impulse, O. S. turns inward nearly to the limit of normal convergence. The action of the left internus as a right rotator, is also limited. In attempts to turn the eyes to the left, the left

eye does not at first pass the median line outwardly. At the same time O. D. turns downward with a rolling movement and then a little inward but tends finally to the median line. The left externus seems completely paralysed; the right internus, paretic for left rotation. Convergence impulse is attended by some adduction. A reflex movement could, however, be excited. When the patient was commanded to fix an object and the head was turned suddenly toward the right, the eyes maintain fixation during the turning. This is only possible by virtue of a compensatory associated movement of the eyes for the turning of the head to the right. The movement of both eyes to the left followed rapidly upon the head movement. The reflexly excited associated impulse stimulated both yoke muscles equally, which was not the case by voluntary stimulation. A simultaneous left facial paralysis lead to the assumption of a pontine lesion involving the nucleus or the root of the left abducens and, the root of the facial nerve, although the retention of a reflex left rotation of the eyes militates against this view.

The value of examination of the eye movements by passive rotation of the head is, according to the author, not fully realized. The question as to whether in total absence of voluntary lateral movement of the abducens the lesion is supranuclear, nuclear or peripheral can be determined by this test only. The author holds that the assumption that the lesion in the above case lies in the nucleus of the left abducens is incorrect. He holds that it lies much further anteriorly and has damaged both dorsal longitudinal tracts but likely only in a circumscribed area, as the ascending fibers as well as the reflex tracts which conduct the impulses from the cortex to the nuclei could not have been completely severed.

Alcoholic Oculomotor Palsies.

RAIMANN, E. (*Jahrb. f. Psych.* XX 61 Abstracted in *Woch. f. Ther. u. Hyg. des Auges*, VII, 6-9), found in 44 cases of alcoholic delirium, 7 cases of extraocular muscular and marked pupillary disturbance. Of the alcoholics with "Korsakof-sche Psychose" oculomotor palsies were present in about 30 per cent; of those with well defined polyneuritis alcoholica in 38 per cent; of those with a single psychosis (paranoia, epilepsie, etc.) occasionally. The most frequent post mortem

findings were, hemorrhages, blood vessel degeneration in the central ganglia in the vicinity of the gray matter of the third ventricle, aqueduct of Sylvius and downward toward the spinal cord, in the neighborhood of the nuclei of the ocular muscles. In some instances these changes were absent, or were present without ocular palsies. The nerves supplying the ocular muscles were for the most part intact both centrally and peripherally. As a rule alcoholic ophthalmoplegias are of central origin and this is more likely to be the case where there is progressive palsy of the extraocular muscles without involvement of the intraocular muscles, or with Argyll-Robertson pupils, or with an uncomplicated intraocular muscle palsy or lastly with myosis. Moreover a sudden onset, a transient course and varying phenomena point to central origin.

The Cerebral Paths for Movements of the Eyes.

BERNHEIMER, St. Innsbruck. (*Graefes Arch.* LVII H-2.) It is known that the middle third of the peduncle of both gyri is the principal cortical area for the synergic associated eye movements upward, downward, to the right and to the left. So long as the stimulus is weak only associated eye movements occur, but if strong, simultaneous face and head movements are added. Other near-by centers are also affected. This explains and confirms the findings of earlier observers that associated movements could be excited from numerous localities in the brain.

It has been assumed that all paths radiating from the angular gyrus terminate in the anterior corpora quadrigemina, and share in the formation there of a reflex center. B. has questioned the presence of this center, since the motor centers of the eye muscles begin ventrally from the aqueduct of Sylvius. In a number of apes experimented upon, B. was able to excite associated movements by stimulating the angular gyrus after extirpation of the corpora quadrigemina. In no animal was it possible to excite associated eye movements by stimulation of the angular gyrus after division of the tissues beneath the aqueduct of Sylvius in such a manner that the median incision reached to the nuclear region of the oculomotor and trochlear nerves, or divided these. By direct stimulation of the nuclear region dissociated movements of the eye could be obtained but not synergic associated move-

ments. According to B. all these experiments prove, directly or indirectly, that the paths leading from the cortical area in the angular gyrus do not pass through the corpora quadrigemina but pass beneath the aqueduct.

B. extirpated the region of the angular gyrus on the left side in apes, and found that the animal in endeavoring to fix objects held to the right was compelled to turn the head in that direction. Toward the left the movement of the eyes was faultless. Normal conditions were recovered after variable periods of time. These observations agree with known facts—that numerous short associated fibers unite the cortex of the gyrus with the contiguous cortex especially with the occipital cortex, that from the visual center long tracts lead to the region of the motor nuclei, out and through the interposition of connecting cells with the cells of the oculomotor nuclei. So long as all of the neuron fibers are not destroyed, so long as any of the collateral fibers remain undisturbed, desired associated movements, can occur.

Several sections of the brains of the apes experimented upon were made and prepared after the method of Marchi. These showed, in all of the specimens, in the region of the extirpated gyrus, longitudinal and oblique sections of black stained fibers of various lengths indicating degeneration of medullary fibers. These were sometimes parallel, at other times divergent in the direction of the cerebral defect, so that there was a considerable bundle of fibers diverging in an oblique frontal direction and converging ventrally into a band several millimeters broad. The fibers began again to separate in the region of the corpus callosum and enter the substance of the thalamus in bundles. In all of these preparations degenerated fibers could be made out radiating in the region of the optic thalami and arching below to reach the nuclear region of the oculomotor nerves under the aqueduct of Sylvius. The bundle was most marked where the pulvinar borders upon the corpora quadrigemina. Degenerated medullary fibers could be distinguished in the region of the posterior longitudinal fibers laterally from the oculomotor nuclei. A second path of fibers extended laterally in the form of an arch, and could be traced beneath the corpora quadrigemina; here they divided and radiated to different heights into the substance of the crura cerebri, turned backward into the posterior longitudinal fibers where they united internally with the oculomotor nuclei.

Investigation therefore demonstrates that the angular gyrus of each hemisphere is connected by an accurately defined path with the oculomotor nuclei of the opposite side. The terminal portion of the path enters the ventral part of the posterior longitudinal fibers and reaches in part, through the interposition of these fibers by means of connecting cells in relation with the motor ganglia, the oculomotor nuclei. In apes, even when the occipital lobes have been removed, severe peripheral irritation excites every part of the nervous system and produces muscular movements. Irritation of the oculomotor nuclei results in the usual synergic associated movements, as the entire apparatus of the mechanism of the associated eye movements to the connection with the cortex is intact. As before, the nerve nuclei, through the various and varying fibers in the posterior longitudinal bundle, remain in union with one another, and can independently of the cortex and angular gyrus, as the result of peripheral irritation, which reaches them through the tract of the trigeminus or the sympathetic, excite synergic associated movements. The moment the symmetrical median regions are separated, as by a median incision, and the contact relations divided, every orderly associated movement ceases the animal responds to peripheral irritation only with irregular dissociated movements.

Two Cases of *Cysticercus Cerebri* with Choked Disc.

JACOBY, E. Breslau. (*Klin. Monatsbl.*, Sept., 1903. Abstracted in *Woch. f. Ther. u. Hyg. des Aug.*, VII-II.) J's cases coincided with other similar cases in literature in the absence of localizing symptoms. In the one case in which there was constant localized headache, trepanation was done without disclosing the lesion. The symptoms found in these cases tend to corroborate the claims that prominent irritation symptoms with a vacillating course point to cerebral cysticercus. Optic neuritis, with or without hemorrhages, fundus changes, oculomotor palsies and nystagmus are inconstant and are due to increased intercerebral pressure. Both of J.'s cases came to section. Leber's demonstrations that severe fibrino-purulent inflammation can be excited without bacterial influence, and the literature of the intraocular cysticercus demonstrates that in this affection we

have to do with an intensely toxic as well as mechanically irritating organism.

Sympathetic Ophthalmia and Deafness.

BLASCHEK. (*Univ. Augen. Kl. Graz. Zeitsch. f. Augenheil.*, IX Sup. Wochen, f. Ther. u. Hyg. des Aug. VII-7.-B's case occurred in a 12 year old boy. Enucleation failed to arrest the already well advanced inflammation and at the end of two months time it was necessary to remove the second eye. The sympathizing eye showed thickening of the membranes with little or no exudate. The granulation masses of this hyperplastic inflammation resembled a sarcoma filling and breaking through the eyeball. Soon after the enucleation of the exciting eye, when the sympathetic inflammation was at its height, difficulty in hearing and later delirium and fever with complete deafness of central origin came on. No other nerves were affected.

A second case occurring in the service of Sachs is recorded in which an eye with irido-cyclitis after cataract extraction excited sympathetic disease in an eye from which also a cataractus lens had been removed. At the acme of the inflammation deafness supervened. At the end of two weeks improvement set in, and in five weeks' time was normal. As none of the nerves lying between the auditory and the optic nerves, were affected, the author assumes that the neuritis and perineuritis extended along both optic nerves and tracts, to the external geniculate bodies, and that the internal geniculate bodies, which are in relation with the auditory tracts, became sympathetically involved. It is by no means to be assumed that a migration of microorganisms occurs but rather that it is a remote effect.

Dionin.

BLOCH, RICHARD, (*Deutsche Praxis*, 1903 25.—Abst. from *Woch. f. Therap. u. Hyg. des Aug.*, 1904, 14), as a result of his experience with Dionin (which on the whole agrees with the literature of the subject) makes the following observation: The Dionin reaction occurs only in eyes presenting pathological conditions (not including the refraction anomalies). In healthy eyes it acts only as a foreign body. The degree of reaction differs with the affection but is always most marked at the primary instillation; grows less at each

succeeding inflammation and fails to occur after from 4-6 days, to recur with the primary intensity if used again after several days interval. In the variation of its reaction lies the reason and the explanation for its variable therapeutic results; the physiological effect being that of a lymphagogue. The greater the reaction the better the results obtained, in diseases of the cornea and of the anterior section of the eye. To the curative effect of Dionin the author attributes the fact that in 6 cases of suppurative keratitis and ulcer of the cornea with hypopyon, cure was effected without the use of the cautery. In a case of acute inflammatory glaucoma the ocular as well as the neuralgic pain was relieved and did not recur with great severity. The result is attributed to diminution of intravascular tension. Its greatest value is in the treatment of corneal opacities, either in the inflammatory or quiescent stage for the treatment of which previous methods and remedies have been unsatisfactory. He considers it important that the drug be employed intermittently—using it 4-5 days in combination with atropine and calomel insufflations, then omitting it but continuing the other measures 4-6 days. As to its employment, a speck of the powder is more active than a 5 or 10 per cent. solution.

A Case of Bilateral Purulent Conjunctivitis Following Dysentery.

Vossius, Glessen. (*Dis Ophth. Klinik*. VIII, 12) The rarity of eye complications in dysentery makes the case of Vossius of particular interest. It occurred in a man 28 years of age. In the third week of an attack of dysentery a urethritis with a mucopurulent discharge, containing no gonococci, but a large number of bacilli resembling the bacteria coli, came on. A few days later a conjunctival inflammation in the left eye was followed on the next day by a similar inflammation of the right eye. A bacillus somewhat similar to that found in the urethral discharge was found in the discharge from the eyes. The condition resembled a light attack of blennorrhoeal conjunctivitis, the striking difference being the relatively slight secretion. The corneae were intact. After a period of improvement rapid failure of vision, with severe pain, developed as the result of a severe iridocyclitis accompanied in the right eye by infiltration in the deep layers of the cornea, which appeared

first in the left eye, and only in the left at the time of subsidence of severe symptoms in the right. Both eyes contained granular vitreous opacities. In the third week of the ocular disturbance severe pain without swelling occurred in the right knee, accompanied by a recrudescence of the inflammation of the right and in the urethra. As no cultures were made the question as to whether the bacteria were the *baccilli coli* or the *baccilli dysenteriae* remains unanswered. The author considers the eye complication to have been metastatic and not due to direct contagion

Periostitis and Osteomyelitis of the Roof of the Orbit.

v. AMMON, Munich (*Arch f. Augenheilk.* XLIV B-1 H.), reports a case of this affection which shows that the subsidence of urgent inflammatory symptoms under the use of poulticing does not necessarily indicate the removal of the danger.

The patient was 20 years of age; had, during the course of an attack of erysipelas, developed marked swelling of the lids with some conjunctival chemosis and swelling in the region of the lacrimal sac. On the 17th day the swelling of the upper lid had greatly increased, and it could scarcely be moved. At the inner third there was a circumscribed, deep red area of skin with a scab. The upward movement of the eyeball was limited. There was marked tenderness but it could not be determined whether this was of the lid or of the underlying periosteum. No fundus changes were present and the vision = $\frac{1}{3}$. Under poulticing the superficial swelling subsided and a spindle-shaped cord could be felt in the orbital tissues up and in from the globe. On the fifty-eighth day the reduced vision now = $\frac{1}{2}$ was all that remained of the disturbance. Two months later cerebral symptoms developed, and on the fifth day right-sided choked disc was present. The pupil was dilated. There were no other localizing symptoms. Death occurred on the sixteenth day. Section showed abscess of the right frontal lobe. The entire lobe, inferiorly being filled up. There was a rupture into the right anterior horn of the ventricle, acute leptomenigitis of the inferior surface of the brain, necrosis of the bone in a circumscribed area of the roof of the orbit, the periosteal covering being smooth, and on the brain surface unchanged. One cm. from the middle of the lesser wing of the sphenoid, in the vicinity of

a roughened and gray discolored area of bone, there was a reversed area, about the size of a bean, having a small plaque in the middle containing a drop of pus. Through this a probe could be passed into the orbit. Posterior to this, in the region of the temporal and sphenoidal fissure the bone was reversed in such a manner as to leave the right lesser wing of the sphenoid unaffected. The superior orbital fissure showed no involvement. The pus gave a pure culture of staphylococci. The entire orbital contents were eviscerated for microscopical study. There was firm union between the periosteum and the bone in a circumscribed area at the temporal side of the orbit. The orbital tissues at this point were congested. The same conditions existed in the position of the perforation in the roof. The fascia of the levator, superior and externa rectus muscles showed small celled infiltration. There were no changes in the blood vessels. The fibrous sheath of the optic nerve showed a moderate nuclear infiltration penetrating to the arachnoid and pial sheaths, and also into the interstitial connective tissue. In the vaginal sheath there was a fine granular clot with nucleated round cells, well marked endothelial growth, and an increase in the glial nuclei of the optic nerve. The other nerves were normal. The fat tissue was unaffected. The thickening periosteum showed mononuclear infiltration with an occasional cell containing two nuclei.

The clinical diagnosis had been at first purulent inflammation of the orbital tissues, but later brain abscess from extension either by the veins or through the superior orbital fissure. The anatomical diagnosis was periostitis and osteomyelitis within the orbit. The case demonstrates that osteomyelitis of the roof of the orbit, with but little implication of the periosteum, can exist under the clinical picture of orbital phlegmon, and it teaches that spontaneous healing of such a condition must be viewed with suspicion and brings up the question whether in cases where not only the location of the pus but the existence of pus itself is in doubt, an incision should be made. The author says that given a picture indicating an inflammation of the roof of the orbit or of its vicinity, the patient should be informed of the danger to life, and probe like incisions with extensive separation of the periosteum from the roof must be made. The author has had the opportunity of proving the wisdom of this advice in a case

in which this procedure was successfully carried out.

A Contribution to the Casuistics of Percussion Cap Injuries to the Eye.

BAR, Innsbruck (*Arch. f. Augenheilk.* XLIX B., H. 1), reports a case of injury by explosion of a cap. The cap penetrated the sclera to the inner side of the cornea, went through the ora serrata and vitreous, injuring the retina and chorioid in the macular region; rebounded and lodged between the fovea and the disc. Ten days later the ophthalmoscope showed a large, vertically oval, bright, white, blister-like elevation to the outside and adjacent to the papilla. It was about 4 disc's diameter in its vertical measurement and about one in the horizontal. Its anterior surface was about 7 D. prominent. It moved with the movements of the globe. The foreign body was successfully probed for through a scleral incision. Later the eyeball became soft and was removed. The lens was normal. The sclera was thickened in the equatorial region. The chorioid was everywhere in apposition with the sclera and showed circumscribed thickening in the macular region. The retina was detached behind and in, and thrown into narrow folds the results of preservation of the globe. Downward from the disc and almost immediately outward from the sagittal section there was a sharply defined abscess in the vitreous about the size of the lens. In its midst was a splinter of cap. The abscess was scarcely 2 mm. from the wall of the eyeball, and rested upon the rolled up retina. There was retina also between it and the vitreous, so that the abscess was bounded in front, in and behind by retinal tissue.

Microscopic examination showed that as the result of the chemical excitation of the copper there was set up a localized, circumscribed, purulent inflammation in which the retina was greatly implicated. The inflammation was aseptic, as copper is usually incandescent on entering the eye. The chemical action had set up a proliferation of the supporting fibers of the retina, and connective tissue cells had begun to develop in the nerve fiber layer, and finally a true connective tissue membrane had formed which had acted as a protection against the spread of the purulent and chemical action of the copper. This explains the inertness of such bodies within the eye for years. In this case it is of interest to note

the prominent part taken by the retina in the process. The knife had struck the abscess which had in part flowed off. From the wound granulation tissues had grown into the vitreous pushing the retina before it. Through the drag of this and the proliferated connective tissue, upon the retina the remarkable picture presented was produced. How much the incision had to do with the production of the retinal detachment is hard to say, as it is well known that the prolonged presence of copper or iron in the eye produces, through chemical decomposition, detachment of the retina.

The Effect of Radium Rays Upon the Visual Apparatus.

LONDON, E. S., St. Petersburg, (*Graefes Arch.* LVII., H. 2), comes to the following conclusions as to the effect of radium rays on the visual apparatus:

1. Radium rays excite within the eye the perception of light, even when at a considerable distance from it. They act upon the retina, from either side of the membrane, or through how many more or less penetrable interposed obstacles.

2. Radium and light rays which differ in their physical attributes likewise differ in their physiological action upon the visual apparatus. Radium rays, in themselves, do not increase the visual power of the eye.

3. Radium rays without being reflected or refracted by the media of the eye, are at the same time, in a measure absorbed by them.

4. By sufficiently long and energetic influence upon the eye, radium rays can excite in the different sections of the eye, inflammatory conditions (e. g., keratitis and retinitis and, by prolonged action, even phthisis bulbi).

5. It is very probable that radium rays are capable of acting directly upon the central visual apparatus.

6. Bandaged eyes are capable after some practice of detecting the source of the rays and of recognizing simple figures written, with the rays, in space.

7. By their action upon the parium platino shade the radium rays excite diffused light rays of certain wave lengths admixed with heat rays. The latter being only to a slight degree appreciable to the eye. In a dark room this light is easily perceptible to the retinal elements spared in atrophy of the optic nerve.

The Action of Atropinum Methylbromatum.

WINSELMANN, Berlin. (*Die Ophth. Klinik.* 22, 1903.) From a series of experiments undertaken with this drug in varying strengths, alone and in combination with cocaine, W. found that in 1/2 per cent. strengths it curtailed the power of accommodation 5 D., the effect lasting 22 hours. The same strength in combination with cocaine produced more rapid mydriasis and a greater cycloplegic effect. When 1/4 per cent. solutions were used the effect upon the accommodation was so slight (1D.) that it could be ignored. He advises the use of 1/4 per cent. solutions without the addition of cocaine.

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Pseudo-cataract.

HALBEN, Greifswald (*Graefes Arch.*, LVII—H. 2), has observed three instances of lenticular reflex accompanied by a difference in refraction between the centre and periphery of the refracting media (acquired M., the periphery H.); by disturbing metamorphosia; dazzling phenomena and reduction in the acuity of vision to about 1/10; the appearance of a flattened-conical shadow within the lens, which by diffused light appeared as a dense cobweb-gray cloud (greenish by daylight) against the black periphery of the pupil; by oblique light, as two opposing shining bands and by transmitted light, as a relatively transparent drop-like shadow which in rotation of the mirror travelled in the direction of the area of illumination of the fundus.

The extracted lenses were sectioned and studied microscopically. The nucleus was found to be much harder than those of 23 other lenses similarly prepared. The outer bright yellow portion was in the shape of a sharp oval which enclosed a waxy brownish-yellow zone, the line of separation between this area and the inner being indented. The inner zone was of a whitish-yellow color and looked in places, as though fractured. In all of the lenses examined, only at the border of the extracted portion and in the extreme periphery was there found clefts and spaces filled with Morgagnian spheres. In so far as these were not artefacts they are to be considered as related to the granular opacities observed in the periphery of the lens. The result of the microscopic findings was that no changes were found which would account for the clinical phenomena. A deter-

mination of the index of refraction of the extracted lenses showed for the periphery, 1.3905, the layers beneath, 1.3925, the margin of the nucleus 1.403, somewhat deeper, 1.409 and the centre of the nucleus 1.443.

The author considers the phenomena due to a peculiar change in the lens whereby the maximal index of refraction of the nucleus of the lens is greatly increased, as a result of which there is an abnormal abrupt change between the index of refraction of the centre of the lens and the peripheral portions.

Experimental studies with animal lenses and with models seem to prove that these changes are due to a decrease in the watery constituents of the nucleus, as by dehydration of the nucleus an even greater increase than that found could be produced. The abnormal hardness and brittleness of the nucleus also strengthens this view.

The author discusses the question whether this condition may not be an early transitional form of so-called cataract nigra, in which, likewise, no pathologico-anatomical cataractous changes are found, and in which the lens is abnormally hard throughout.

ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.

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**A Simple Method on Enhancing the Effect of Tenotomy for
Correction of Strabismus.**

KRAUSS, FREDERICK, Philadelphia. (*Amer. Med.*, Nov. 21, 1903.) "After a tenotomy, more or less complete, according to the effect desired, the patient is placed in bed for 24 hours with a bandage occluding the operated eye. The bed is placed in a corner of the room in such a position that the natural tendency of the patient is to turn the eyes in the direction desired by the operator.

In the case of the older and intelligent patients, I place an object of interest upon the opposite side of the room, and ask them to fix their eyes upon it as much as possible, or at least to look in that direction. In younger children in whom an operation may occasionally be desirable, I place the bed in the ward so that of their own free will they look in the de-

sired direction in order to see the phenomena of hospital life."

N. M. B.

Stereoscopic Exercises with Series of Pictures to be Used in Amblyopia and Squint.

HALE, A. B., Chicago. (*Jour. Amer. Med. Assn.*, Oct. 10. 1903.) The originator being convinced that the stereoscopic exercises 'now in vogue while excellent for laboratory or office use, find but limited use when given to the patient for exercise at home as they are all, except Würdemann's reprint of Kroll's plates, printed in a foreign tongue and have pictures strange to the American eye.

Hale's exercises illustrate five stages:

1. Simple tests to measure what the one eye or both eyes together can do.

2. Simple tests of the ability of each eye to see its own field and to retain the impression while the other eye also sees.

3. Tests in which each eye sees what it at first takes to be the same picture, but in which the half for each eye lacks some detail present in the half for the other eye; the halves are probably fused, or the patient thinks they are, but a failure to fuse can be detected by the omission from the patient's description of one or more details.

4. Tests in which not only is there an instinctive stimulus to fusion, but also the added factor of depth for the figures are so arranged that each eye obtains a picture presented to it at an angle differing from the angle of the other eye, and the completed picture seen with both eyes acting together should be that of a solid body, i.e., there should be a perception of depth in addition to fusion; stereoscopy, the perfected act of binocular single vision.

5. Tests by means of pictures of what we habitually see in the outer world, in which have been introduced two ordinary photographs from life and a simple catch card for reading, in which each eye is deprived of some letters visible to the other eye, so that both eyes must be used together and simultaneously before the story can be fluently read.

N. M. B.

The Voluntary and Involuntary Brain Centers Controlling the Ocular Muscles

SAVAGE, G. C., M. D. (*Journ. Amer. Med. Assoc.*, Nov.

14, 1903.) "There are two groups of brain centers for controlling the movements of the eyes. One group is found in the cortex, and consists of nine distinct centers. In this group are two more centers, making eleven in all, but these two are connected with muscles within the eye, viz.: the Müller muscle in the ciliary body and the sphincter of the iris, and will not be specifically studied in this paper. The second group is located at the base of the brain, and consists of twelve distinct centers. In this group are four more centers making sixteen in all, but these four are connected with the muscles within the globe."

He acknowledges that these centers are not now susceptible of anatomic proof but thinks that shortly they will be shown by further investigation. He thinks that there is now sufficient pathologic evidence pointing toward their existence.

He very fluently draws a word picture of their functions and probable location accompanying this description by a diagrammatic representation.

"In the same manner as above every possible rotation of heterophoric eyes could be studied, showing exactly the basal centers that would be called into action to prevent diplopia. But the further study would only do what has already been done; that is, establish the fact that the brain centers under the control of volition have nothing to do with the correction of heterophoria, but that this work is accomplished by those centers under the control of the fusion faculty of the mind.

From the foregoing study of the voluntary and involuntary brain centers controlling the ocular muscles, the logical conclusion concerning heterophoric conditions is as follows: These errors should be corrected by non-surgical or surgical means, so as to give to those brain centers which are under the control of the fusion faculty that rest from all excitation which they have in orthophoria. This can be done only by making the tonicity of the one muscle equal to the tonicity of the other muscle of any pair."

N. M. B.

Influence of Accommodation and Convergence Upon the Perception of Depth.

BAIRD, T. W. (*Amer. Journ. Psychology*, October, 1903). attacks the much disputed question as to what part these

mechanisms play in our visual perceptions of the third dimension. The evidence adduced speaks unequivocally for the influence of movement factors upon the visual perception of depth, and points to some such theory as that of Wundt, who concluded that in binocular vision the perception of approach and recession of an object (a fine black silk thread seen against a white background through an observation tube) is the resultant of sensations of convergence, while in monocular vision sensations of accommodation cause perception of approach alone. The author reviews the history of this subject from the empirical but interesting views of Leonardo Da Vinci in the *Treatise on Painting*, the observations of Berkeley and Descartes, the first experimental investigations, those of Hueck, Hermann Meyer, and the important work of Wheatstone and Dove, who, by getting stereoscopic effects with instantaneous exposure, refuted Bruckes' theory that minimal motions of the eye caused sensations of depth, down to the recent studies of Wundt, Hillebrand, Arren and Dixon. The experiments show that: (1) Both the approach and the recession of the fixation object can be perceived. (2) These changes of accommodation. (3) Muscular sensations of accommodation constitute the sense basis of the perception both of approach and recession.

P.H. F.

Hysterical Blindness (Binocular).

BRYANT, D. C., Omaha. (*West. Med. Review*, October 15, 1903.) Bryant calls attention to the rarity of cases of bilateral complete blindness from hysterics and distinguishes them from the more common forms of partial blindness known as hysterical amblyopia.

The clinical history is given of two cases which have occurred in his practice during the past few years.

In the first case patient was a young girl aged 17, family and personal history good. Owing to slight accident, patient had fallen on floor, became unconscious, and when consciousness returned patient claimed to be totally blind and partly deaf. Examination showed blepharospasm of eye lids in both eyes, with dilation of both pupils, which responded to light, no signs of injury and no pain. Ophthalmoscopic examination negative. Patient remained in same condition until morning of 15th, day after accident, when she awoke with perfect vision.

In the second case the patient was a young lady aged 26, neurotic, and had been subjected to an unusual amount of worry. Vision began to fail suddenly and in one-half hour she had lost all perception of light. No ophthalmoscopic changes. On morning of tenth day after onset of the trouble patient awoke with normal vision.

The author believes in the correctness of Gowers' statement, that in hysterical blindness the source of the disturbance is in the cortex of the brain. W. R. M.

A Case of Diabetic Lipaemia, in Which the Blood was Examined During Life.

WHITE, W. HALE, London. (*The Lancet*, Oct. 10, 1903.) The writer gives an account of a case of this rare condition in which the fatty blood was recognized in the retinal vessels by the ophthalmoscope; the article is accompanied by a chromolithographic illustration of the ophthalmoscopic appearances of the fundus. After giving a number of references to previously reported cases, he continues: "I should not, for my own part, say that lipaemia in diabetes is excessively rare and I know of at least one other patient in Guy's Hospital in whom this condition of the blood was observed in the retinal vessels. I have called this condition "lipaemia." for this word is constantly used in describing the blood when it is of a pale salmon color. This is most often seen in diabetes, but it has also been described as occurring in alcoholism, phosphorus poisoning, pneumonia, peritonitis, and gout. Of these rarer causes probably alcoholism is the most frequent. Most authors say that under the microscope fat globules may be seen and also very fine granules. In many cases undoubted fat granules are present, for they are described as staining with osmic acid and they are depicted by Saunders and Hamilton. But these authors, like others, also describe "a finely granular precipitate evidently not of an oily nature," and they also speak of the albuminoid precipitate as showing no change with osmic acid. Futchner found that the turbidity of the blood was only in part cleared with ether and many of the granules were not stained black by osmic acid, and he points out that the turbidity is only partially due to fat and suggests that the granules are in part albuminous. Others have suggested that the granules are particles of fat surrounded by an albuminous envelope.

One of the points of interest in the case recorded is that a careful microscopic examination of the blood failed to show any fat globules or anything that stained with osmic acid, and so we learn that this pale, turbid, salmon-colored blood may contain not only fat globules and a granular precipitate, but this granular precipitate may be all that is observed although the blood is markedly changed. Mr. S. W. Cole kindly analysed in the Physiological Laboratory at Cambridge some of the blood removed by venesection during life. He says: "I find the white substance is insoluble in water and salines, but more or less soluble in alkalies. It seems to be a proteid precipitated out by the presence of a fatty substance, but what the proteid is I was not able to discover. The fatty substance is not true fat but apparently an ester of cholesterine with one of the higher fatty acids, or a mixture of them. I extracted the ester from the precipitated body with alcohol and saponified with alcoholic soda and then extracted the residue with hot chloroform. This on evaporation leaves cholesterine, which gives the usual tests and was also identified by its crystalline form. I could not possibly tell, of course, the acid with which it was originally combined." We thus learn that the term "lipaemia" is not strictly correct, for the turbidity is not entirely due to fat globules—indeed, they may be absent when the turbidity is marked and then, in addition to a precipitated proteid, there is present a substance which, although allied to fats, is not a true fat.

The ophthalmoscopic appearances, the arteries and veins, it will be noticed contain blood of a similar color, and this color is a deep cream which in the larger vessels passes into a pale salmon color, for here there are enough blood corpuscles visibly to modify the cream color. The vessels appear a little larger than usual; the whole retina is pale. Reference to Heyl's paper will show that this description, which was written before I read his, accords with it. Unfortunately, when the patient was under observation I was unaware of Heyl's paper and consequently of the interesting discussion raised in it as to why the vessels appear large.

Most cases of diabetic lipaemia that have been recorded have been fatal and it has been suggested that the lipaemia is the cause of the coma. That is not now believed and I can testify that it is not so, for I have in many fatal cases of

coma failed to find this condition of blood. My case, like Futchner's, shows that as the patient improves the lipaemia disappears; further, it shows that as the lipaemia goes the fundus of the eye becomes healthy-looking. No satisfactory explanation of the lipaemia has been given. Certainly in my case it bore no relation to diet."

C. H. M.

Eye Changes in Relation to Renal Disease.

NETTLESHIP, EDWARD, London. (*British Medical Journal*, September 26, 1903.) "Although much attention has been bestowed upon the retinal changes that occur in renal disease, information is still needed upon several points. It is of course in chronic interstitial and parenchymatous nephritis that albuminuric retinitis commonly occurs. A few cases are on record where it has occurred in connection with lardaceous disease, and with nephritis due to inflammation of the bladder, ureter or pelvis of the kidney; but additional cases in connection with any of these maladies are worthy of careful record. I give details of several of such cases. The chief exception to the rule is the retinal changes depending on the chronic nephritis seen in pregnancy, the special character of which is rapid degeneration of the epithelium such as is found in some forms of acute blood poisoning. Though the condition is not true inflammation, the kidney so affected may pass with unusual rapidity into a condition of chronic nephritis and contraction. Any evidence as to the state of the kidney before the first pregnancy should be recorded. This may be of great importance in deciding whether or no the uterus should be prematurely emptied.

I agree with the usual statement that the prognosis in renal retinitis due to pregnancy is better than in ordinary cases. Out of 22 cases of pregnancy retinitis of which I have notes, 41 per cent. or two-fifths are known to have lived for 2 years or more after the retinitis, while of 41 cases of renal retinitis not due to pregnancy only 22 per cent. or barely one-fifth, lived for more than 2 years. The majority of cases of pregnancy retinitis do not occur until after several pregnancies, but when it occurs during the first pregnancy subsequent pregnancies may occur with no return of the renal or eye symptoms."

As to sex, Nettleship found the proportion about two males to one female. The age ranged from 36 to 60, the

most prolific single decade being from 50 to 59; in pregnancy cases from 30 to 39. The prospect of life seemed to be better when renal retinitis occurred after 55 than before.

"The two chief factors in the production of renal retinitis are (1) a morbid state of the blood, and (2) a diseased condition of the retinal arteries, and in most cases the two are combined. The blood state is the chief cause of the severe acute cases with great edema, etc., and these patients often recover both health and sight, and this is especially seen in the favorable pregnancy cases.

I think that an early stage of granular kidney may fairly be suspected whenever decided hyaline thickening of the retinal arteries is seen by the ophthalmoscope, and that this suspicion will be much strengthened if the patient be comparatively young. This hyaline thickening of the retinal arteries is doubtless, spread unequally throughout the system, and it may be conspicuous in one eye and insignificant or absent in the other, while even the arteries in the affected eye are by no means always equally changed in all parts of their course.

Whether the thickening of retinal arteries, specially described by Gunn and others, is so useful a diagnostic sign of granular kidneys in elderly people is, I think, an open question; but, anyhow, it should be looked upon as a sign of the danger of cerebral hemorrhage. I agree with Dr. Samuel West, who thinks that the more violent cases of retinitis are chiefly toxic, and that the milder and more chronic ones are often chiefly vascular in origin. I, however, think it unnatural to draw a sharp distinction between the "exudative" or "inflammatory" and the "degenerative" varieties, or to associate either form with any particular kind of chronic nephritis. I feel clear in my own mind that there is only one sort of renal retinitis, and that the many varieties and changes seen during life indicate only different stages and degrees of general edema, exudation, and degeneration. The patches of exudation into the nerve-fiber layer form white or greyish-white, soft-edged patches of moderate size, and scattered about the optic disc region. These "woolly" patches form early in the attack of retinitis, but as the individual patches often disappear and fresh ones frequently form later, they may be present both early and late in the disease, and with various degrees of general haze and edema. The other

kind of opacity appears later in the form of intensely white, sharply-defined rounded dots, which when they become confluent form spots or patches. They are specially apt to occur in the yellow-spot region, and are so arranged as to form the well-known stellate figure. They are never in front of the retinal vessels. They may be expected from four to eight weeks after the onset, or later.

Various other constitutional or local conditions may produce retinal changes similar in appearance to those of renal disease, and one of the most important is glycosuria. Out of my 59 cases of retinitis in diabetes, only 7 occurred in hospital patients. In many a little albumen was present as well as sugar; but it is well established that retinitis may occur in diabetes without albuminuria. Diabetic retinitis differs somewhat in ophthalmoscopic appearance from the renal cases. The life prospect is in my opinion better in the diabetic cases than in the renal ones, though the data on which my conclusions are based are too small to admit of a positive statement.

The typical renal retinitis is nearly always symmetrical, though often one eye is worse than the other. Occasionally, when hemorrhage is the chief sign, one eye only may be affected. There is reason to think that the retina, atrophied by previous disease, may be unable to take on the changes constituting renal retinitis. It would be interesting to know of any instances in which a second attack of renal retinitis has occurred after the first had cleared off. However this may be, there are cases to prove that recurrences of retinal hemorrhages do occur in the eyes that have passed through an attack of albuminuric retinitis.

Occasionally pigmentation of the retina and night blindness are present. I consider that most of the cases of chorioiditis described as of renal origin are secondary to retinitis; but the vessels of the chorioid are sometimes much diseased." C. H. M.

The Use of Retinal Extract in Atrophic Retinae.

DOYNE, ROBERT W., Oxford, England. (*Brit. Med. Journ.*, Sept. 28, 1903.) Referring to a previous article on this subject in which the matter was treated in general terms, published in the British Medical Journal for July 25, 1903, the writer draws attention to the value of this treatment and

gives the results obtained in particular cases. Concerning the manner in which this remedy appears to act he says: "When I first used it I did so with the idea of supplying in excess to the blood a specific food that was especially valuable for the retina as being more or less identical tissue, but the results have been so marked as scarcely to be sufficiently accounted for, to my mind, by the absorption of a food of identical anatomical character; they seem rather to point to the presence of some physiological principle such as is found in the case of thyroid gland."

An attempt is now being made to separate such an active principle should it exist. Ordinary retinal extracts or retinæ preserved in glycerine, are of comparatively little value as compared with fresh retinæ. The retinal extract now put upon the market under the name of "optocine" is a somewhat complicated preparation. The treatment is and probably must remain very expensive since the supply of fresh retinæ is necessarily limited and they are of no use unless perfectly fresh; the difficulty of getting them in large numbers immediately after slaughter entails extraordinary expense, and the preparation of a potent extract involves elaborate care and time. The dose is equivalent to from 6 to 10 retinæ a day. No preparation acts better than fresh retinæ; in small numbers for individual cases these may be obtained without difficulty in the provinces from butchers; the difficulty comes when large numbers are slaughtered by contract and when they cannot reach the retailer till too late.

"In every case in which I have tried this remedy the patient has claimed to have derived benefit, that is of some significance certainly, but nothing more, but among them are cases where I should be unwilling to admit their claim, but in the great majority of cases the improvement has been so marked and definite that I find it impossible not to accept the conclusion that the result is directly due to the remedy. It seems to me to act by bringing out any potentiality that may remain in an atrophic retina, for of course one cannot believe it is possible to do anything for a retina that has entirely ceased to be functional, but no doubt there is a stage in which no ordinary light stimulus is sufficient to excite function. Such a condition is well compared with the difficulty, and later on impossibility of reading as evening falls; there comes a stage in which the light, though present

in a certain degree, is insufficient for exciting the function of the retina; and this feeling appears to do for the atrophic retina what an artificial illuminant does for a normal eye when daylight is insufficient. This kind of analogy is well borne out by watching the cases. A patient may say 'I do not think I can see any smaller print, but everything looks clearer and blacker,' or again, 'for the first time for a long while I could read my letters quite easily this morning, the writing generally is as pale as the paper, but to-day it was much blacker.' These are instances of remarks made as patients have first begun to improve. Now, I may point out the value of such testimony in differentiating such improvement from mere fancied improvement; for if it were only a case of the wish being father to the thought, they would look out for and claim to read smaller print, to read for much longer, or something of that sort; but the claim they make is just that which physiology would lead us to expect.

"I first tried this remedy in retinitis pigmentosa, for it was in connection with that disease that the idea first developed in my mind. I have used it in five of these cases, and in every one of them there has been very distinct and real improvement. It is interesting to note that in two of these cases the patients have claimed and undoubtedly have seen to read much more readily in a comparatively weak artificial illumination; for instance, about 3 ft. or 4 ft. away from an 8-candle power lamp. It would be going out of the scope of this communication, besides taking up too much time, to go into explanations of this fact—for fact it certainly is—and it has been made quite manifest to me that the renewed function obtained by this remedy has been counteracted by the action of too intense daylight, and this is quite plausibly what one might expect. In such cases as retinitis pigmentosa it will be obviously necessary to keep up the treatment, but exactly how much need be taken I have not sufficient data to form an opinion."

Brief histories of 11 cases in which retinal extract caused improvement in sight are given. In the first case no diagnosis is given. The second case, one of retinitis pigmentosa, showed an improvement of V. R. from 6/24 to 6/12 and V. L. from 6/60 to 6/24 after 3 weeks' administration of fresh retinae. Case 3, retinitis pigmentosa—before treatment, V. R., was words of J. 14, V. L. words of J. 12; after one

month of treatment V. R. was J. 14 and V. L. J. 8 and words of 6. In a case of tobacco amblyopia in which V. R. was 6/60 + 3, J. 16, and V. L. 6/60 + 3, J. 14 the V. was 6/18 and 6/9 respectively after 19 days' treatment, but no mention is made of the continuance or discontinuance of tobacco. In another case in which tobacco was not discontinued. V. R. was 6/36 with correction, J. 16?; V. L. 6/60 J. 14; after nineteen days of treatment V. R. 6/12 J. 1, V. L. 6/24 J. 4. Another patient with tobacco amblyopia of long duration improved from V. 6/50 to 6/24 after 2 weeks' treatment. The tobacco cases gave very definite evidence in favor of the treatment.

The writer give the histories of two cases of primary optic nerve atrophy which were benefitted. "It is difficult to understand how such cases improve, unless it be that the increased functional activity of the retina gives a stronger stimulus than it can get through the wasted fibers. I give you the facts of this case, which are striking, and I cannot conceive leave much room for doubt.

L. G., aged 28, came under treatment at the Oxford Eye Hospital on Sept. 18th, with the history that she had been attended at the Manchester Eye Hospital with optic neuritis after premature labor, the result of a fall; that after 14 days confinement her vision began to fail and that she was absolutely blind to light for one month, having been tested by a candle held close to her eyes. Whether that observation was correct or not I cannot say, but when I saw her on Sept. 18th her V. was R. fingers at 2 in., L. fingers at 3 in. and she was led about. Some very slight improvement took place in the next eight months under the usual treatment.

On May 21, 1903, when she began retina feeding, V. was R. Jaeger, 19; L. Jaeger, 20.

May 30th (only nine days later): V. R. and L., 7/11.

June 2nd: Jaeger 12 (words of).

June 8th: Jaeger 10 (words of).

July 2nd: Jaeger 6 (words of).

July 23: Jaeger, 4 (4 words of). She can walk alone about the town and do shopping. She is, however, still color blind, and sees better in dull light."

"I have had excellent results from cases of old chorioiditis and cases of damaged and thinned retinae of high myopia. I say nothing of functional cases for, if it be true, as I hope

I have proved, that this remedy is of value in gross organic lesions it must be of value in merely functional exhaustion. When I first began to turn my attention to this subject I had no idea that it had been in any way approached before, but Mr. Sydney Stephenson very kindly looked up the literature of the subject, and has shown me that Louis Dor in 1897, employed an extract of the ciliary body, and that Lagrange in 1898 used an extract of vitreous body and ciliary body combined which was called "oculine." I understand also that chorioid, retina, vitreous, and ciliary body have also been extracted together and used. I believe I am correct, however, in saying that retina in the way I have put before you to-day has never been so employed before, and I may reiterate the fact that unless it is specially prepared it has comparatively little effect."

C. H. M.

On the Treatment of the More Serious Syphilitic Diseases of the Eye.

DARIER, A. Paris. (*Ophthalmoscope*, Nov., 1903.) "Eye diseases, when of recent and undoubted syphilitic origin, are as a rule, quickly and surely cured by the most commonplace mercurial treatment. There exist, however, malignant forms (as is often the case in hot climates) or chronic forms that have been treated just long enough to set up mercurial tolerance without obtaining complete cure. These forms of disease lead little by little to complete blindness."

"It is certain that the method whereby mercury is given has great importance in the treatment of syphilis. There is, however, one thing still more important, namely, that the amount of the drug absorbed must be sufficient to bring about the desired therapeutic result as quickly and as surely as possible, with the minimum of toxic effect or of supersaturation, complications that make the continuation of treatment impossible.

No method of administering mercury allows of such exact control as that by intra-venous injection, inasmuch as absorption and elimination occur with remarkable regularity, provided the emunctories are healthy and functionally active. It is not quite the same as regards subcutaneous injections (however soluble the salts chosen), because resorption takes place more or less slowly according to the parts selected for injection and the density of the liquids employed. If the

injections are repeated frequently, accumulation may therefore occur, and exact control is thereby rendered difficult or actually impossible.

One of the first, I insisted upon the necessity of recognizing what I have ventured to call the "reactional limit" as regards each individual of the mercurial preparations. The clue to this reaction is furnished by the initial sign of mercurial intoxication, such as abdominal pain, colic, or diarrhea, with or without bloody stools.

One must always keep the "reactional limit" in view, and make patients watch for its advent. It tells us the maximum dose that can be administered, and informs us as to the degree of permeability of the kidneys and the susceptibility of the intestinal tract.

The method of using intra-venous injections of aqueous solutions of the cyanide or biniodide of mercury which I recommend, is as follows: I inject, according to the weight and strength of the patient, from one-half to one centigramme of the mercurial salt, and augment the dose daily little by little until some degree of colic is experienced by the patient. I then reduce the dose somewhat, but again increase it after the lapse of several days. I thus reach a point where I am able to inject two or three centigrammes of the cyanide or biniodide of mercury into the system.

With regard to formula, I recommend a one per cent. solution of mercury cyanide in a 0.75 per cent. saline solution. Dose one cc. to two cc. The biniodide is also used in a one per cent. watery solution containing two per cent. of sodium iodide. Dose one cc. to three cc.

If improvement in the eye symptoms is very pronounced, I practice fewer injections—at first, every other day, and, later, every third day—but I do not discontinue them altogether until long after.

Thirty to forty injections are usually needed for a first series. A little gingivitis and salivation are then nearly always present, especially amongst persons whose denture leaves something to be desired. A month's cessation of treatment spent amid good surroundings and combined with ample food, massage, douches, etc., is always desirable before undertaking a fresh series of injections, such as must be made for the more serious syphilitic affections of the eye. After the interval mentioned above, I often practice about a dozen

hypodermic injections of pilocarpine, spread over a month, before again resorting to another series of mercurial injections.

Two years ago, I extolled before the Section of Ophthalmology, at the Cheltenham Meeting, the good effects of local treatment by subconjunctival injections. To-day the importance of local therapeutics, even in general medicine, tends more and more to demonstrate its undoubted power. This is also shown by the brilliant results obtained by local injections in certain forms of arthritis and gummata, of which instances were recently recorded at the Cairo Congress by Prof. Bouchard.

To resume: In grave syphilitic lesions, which have proved rebellious to treatment, before abandoning hope, one should institute an intensive and systematic course. With this end in view, nothing succeeds more surely and with less danger than the intra-venous injections, augmented daily in strength until the point of physiological toleration has been reached. When 12 or 15 intra-venous injections have been made, the therapeutic effect can be potently augmented by performing every two or three days, turn by turn in each eye, subconjunctival mercurial injections. By these means one sometimes obtains unexpectedly good results, although for that, 30 to 40 intra-venous injections and a dozen subconjunctival injections must be made. Some improvement of sight generally comes on during the course, but it becomes much more marked after a period of rest. In order to clinch the cure, I usually make, after a month's rest a series of pilocarpine injections. All of this constitutes, in fact, a kind of "therapeutic cycle," which should be repeated two or three times in a year."

N. M. B.

Some Practical Points in the Treatment of Sympathetic Ophthalmia.

BROWN, EDGAR, assisted by STEVENSON EDGAR, Liverpool, Eng. (*The Ophthalmic Review*, Oct., 1903.) The writers describe a plan of operation which has yielded good results in desperate cases of sympathetic uveitis of the plastic type—"a slow, insidious, eminently plastic iritis, which resists all the usual remedies, and results in blindness in the great majority of cases." They point out that operations upon the sympathizing eye after all traces of inflammation have passed away,

may light up a fresh inflammatory reaction, and that such procedures are likely to be followed by the same kind of severe reaction as are shown in the original wounds.

"This tendency to inflame of all wounds made in the iris, rendering iridectomies practically useless on account of their closure is also intensified by the liberation of any lens matter. Lens matter constitutes a source of irritation in all wounds, whether from being an irrigation in itself or from affording a favorable nidus. In quite young subjects patient and reiterated needling of the lens after the manner of Mr. George Critchett will result in an opening affording passable vision; but in older subjects, on account of the toughness of the false membrane, etc., the lens does not dissolve with the readiness that it would do in an uninflamed eye. Speaking generally, the lens is less soluble in the eyes which have undergone sympathetic inflammation than in normal subjects of the same age, and though perseverance is sometimes unexpectedly rewarded, we frequently find ourselves obliged to practice removal of the lens. This procedure intensifies the tendency of all openings, that we may make, to close.

Removal of the lens under these conditions is no easy task, as all the structures are bound together and are excessively rigid. In a typical case which came under care some time after enucleation of the wounded eye, an incision as for ordinary cataract extraction was made; then an incision was made in the iris as near the corneal periphery as possible, and parallel to the first incision, with a keratome; then with scissors two cuts were made from each end of this wound in the iris down toward the pupil, which naturally was small and fixed; the lens was then forcibly squeezed out with the aid of pressure with the scoop, and a curette introduced into the incisions. The triangular piece of iris was rotten but was partially removed. All this closed up in a few days, leaving a closed pupil and a dense false membrane and capsule. This was then taken in hand and needled—in all some twenty-three needlings and stretchings of capsule and membrane—with the result that a reputed blind man was able to earn a living by such light labor as counting bags and entering the result in a book; he was able to write, but not to read ordinary type."

In another case a variation of the procedure was used

which is likely to be of practical value, and of which it is the main object of this paper to advocate. This was a boy of 17 who had been wounded in the right eye when a child, and subsequently had traumatic cataract and posterior synechiae; an attempt to deal with the cataract resulted in primary inflammation and sympathetic ophthalmitis of the other eye; enucleation followed, and after some attempts to deal with the sympathizing eye the case was abandoned in despair. When coming under the writer's observation, he had bare perception of light. Proceedings were begun by Critchett's method several times repeated, always leading to considerable inflammatory reaction, although stretching or wounding of the iris was carefully avoided. No benefit resulting, the lens was squeezed out through a T-shaped incision in the iris; an iridectomy was then attempted on several occasions, and always failed on account of the firm closure of the opening made as a result of the violent inflammatory reaction. The writers advise that in such cases iridectomies must not be made in the line of the radial fibers, but that a triangular opening be aimed at, so as to cut across the fibers and give them less chance of joining.

Pursuing the reasoning in the above remarks, and assuming the existence of an irritant similar in nature to that originally introduced into the wounded eye and liberated by the operation, it appeared feasible to cleanse the field of operation, and so reduce the irritation to a minimum. To this end a fresh iridectomy was practised and a narrow piece of iris successfully removed, and then a flat nozzle, specially made (similar to Mr. McKeown's, but finer), was used to wash out the anterior chamber with normal saline solution. The irrigation was very prolonged and thorough. The reaction compared with anything that had gone before was trivial: the opening in the iris was maintained but there was subsequently seen stretching behind it a thin perfectly flat capsule which looked black by oblique illumination. This was found to be tightly stretched, and when cut through reacted suddenly. An opening remained, and the patient now has very good vision for large objects and for color, but cannot read any ordinary type. The fact that he has not better vision for smaller objects is due to the condition of his cornea, which is more or less diffusely nebulous throughout. As he has remained more than three years without alteration his condition may be considered permanent."

Another instance is cited which occurred in a man of 40 who had had double iritis which had left the vision greatly impaired; from year to year vision decreased and finally the pupils seemed utterly closed. "With great difficulty a small piece either of iris or membrane, or both, was removed, and a small opening made. For some eight or ten years he managed to carry on his business. The left lens was extracted by the same means of which we have spoken. This was followed by considerable inflammatory reaction and complete reclosure of the pupil; repeated attempts to open it only led to inflammation and failure. The experience of the last case was utilised in dealing with the other eye, and a piece of iris cut away followed by prolonged irrigation. The patient has now very fair sight in that eye, with correcting glasses, + 6 cum + 1.5 cyl. $30^{\circ} = 6-24''$. C. H. M.

On Glaucoma.

WAHLFORS, K. R., Helsingfors. (*Archives Ophthal.* Nov., 1903.) "The question as to the cause of glaucoma has interested ophthalmologists for half a century and has been the subject of zealous study and numerous investigations, and still to-day we have not learned in what the essence of glaucoma consist.

This is due in part to the relatively small amount of available material and in part to the last stages of the disease in the eyes that are examined, when it is no longer possible to say which changes are primary and which have developed in the slow course of the disease—and the increase in tension is only something accidental—a result of the glaucomatous process just as the functional disturbance and the excavation are results of this process; it cannot be regarded as an essential element and much less as the cause of the glaucoma. The cause is therefore the same in simple glaucoma as inflammatory, the difference being that in simple glaucoma the nervous elements of the eye are chiefly affected and early functional disturbances result, while in inflammatory glaucoma the cause acts upon the circulation in a disturbing way and brings about an increased tension besides other results. *Hence increased tension and glaucoma are not identical.*

A second point of fundamental importance for the doctrine of glaucoma is that simple and inflammatory glaucoma are

really one and the same disease and that the same morbid process is active in both cases."

The retention theory, according to the writer, plays an important role in inflammatory glaucoma, but in simple glaucoma increase tension plays only a subordinate part.

"It often exists, sometimes in high degree, but as a rule in simple glaucoma the tension is not greatly increased, and in many cases there may be no increase at all. The latter cases are of the more importance in the explanation of glaucoma, because they show that glaucoma may exist without tension and without retention "

Simple glaucoma is chiefly characterized by the absence of all objective symptoms. There are no circulatory disturbances in the anterior half of the ball, little or no tension, and the excavation appears, as a rule, as a late sign. Externally and in its interior the eye appears normal in every respect, and only its functions are disturbed so as to indicate that a severe morbid process is under way.

This functional disturbance consists in a diminution of central vision, a narrowing of the field of vision, and a diminution of the light sense.

The condition of central vision and of the field of vision, give us no clue in regard to the nature and origin of the disease, since the disturbances might be attributed as well to an atrophy of the optic nerve as to a morbid process in the retina. But the reduction of the light sense in simple glaucoma is a true indication of the nature of the fundamental cause. This symptom of glaucoma is generally overlooked or but lightly regarded. In the beginning of simple glaucoma it is not infrequently the hemeralopia which is the only prominent symptom and leads the patient to the physician. The central vision and field are normal or but slightly affected, the tension is often normal, and only the reduction in the light sense calls the patient's attention to his affection. This hemeralopia may appear several years before the other symptoms of glaucoma.

According to all experience, the cause of hemeralopia is a functional disturbance of the rod-and-cone layer of the retina. In consequence of imperfect nutrition, these elements fail to functionate in a normal manner. Since the layer of rods and cones is not provided with vessels, and the retinal vessels nourish the inner layers of the retina only, we must seek the

cause of the subnutrition in the inner layers of the chorioid.

What the nature of the process may be is *a priori* hard to say, since pathological investigations on this point are incomplete and relatively rare. However, it has been shown that an extensive atrophy of the chorioid is a constant condition in glaucoma."

The author believes "that the cases of acquired retinitis pigmentosa with glaucoma following, which we find reported in the literature, are nothing but cases of simple glaucoma with marked atrophy of the chorioidal pigment.

Again we can imagine an atrophic process taking place in the chorio-capillaris leading to a disturbance of nutrition in the rods and cones, without, in the beginning at least, injuring the pigment.

The functional disturbances in all the varying forms of simple glaucoma are in perfect accord with the supposition of a chorioida atrophy. The diminution of the light sense, the narrowing of the field of vision, and the diminution of the central vision may readily be regarded as results of the atrophic process. The atrophy does not extend at once over the entire chorioid, but begins usually in the periphery and gradually extends toward the centre, although sometimes the reverse of this process is observed."

Regarding the excavation of the nerve head, it results from the chorioidal process, as follows:

"The intraocular tension exercises its influence uniformly over the entire ball, distending its walls in every direction. The resistance of the walls offers an obstacle to the distension, and the two forces are opposed.

The matter is different when the resistance is diminished by a preceding inflammatory process such as a sclero-chorioiditis, for then the normal tension may cause a bulging of the affected part, as in intercalary staphyloma and the like. The conditions are similar with regard to the nerve head.

Even in glaucoma with greatly increased tension we find at times no excavation of the nerve head, but on the other hand it seems that an excavation can take place without an increase in tension. The excavation must depend upon the fact that the tissues of the disc have lost in greater or less degree their resistance. Only two elements can come into

consideration—the nerve fibers and the connective tissue composing the lamina cribrosa. One can scarcely believe that the nerve fibers offer any great resistance to the intraocular tension.

It is therefore the connective-tissue lamina cribrosa which furnishes the resistance. It is formed of numerous interlacing bundles of connective tissue, leaving openings for the passage of the nerve fibers. Although the sclera furnishes the main portion of the lamina cribrosa, the chorioid takes some part in its composition. A great number of vessel-bearing tracts from the surrounding chorioid pass into the nerve trunk and branch in the anterior layers of the lamina cribrosa. These vessels have a thick, structureless, elastic and well-developed muscular sheath. The tracts themselves are so richly pervaded with elastic fibers that these in fact make up the principal part of the connective-tissue structure of the lamina.

Pathological investigations have shown that in glaucomatous excavations an atrophy of the elastic tissue of the lamina—namely, of the inner portion which arises from the chorioid—is unmistakable.

Whether this atrophy is the result or the cause of glaucomatous excavations it is difficult to decide from a pathological standpoint, since the investigations made have been on eyes with old glaucoma in which it was no longer possible to distinguish primary from secondary changes. Since, however, as we have seen, the cause of the excavations is to be sought not in the increased tension but in the diminished resistance of the papillary tissues, it is probable that the atrophy is primary and the excavations secondary. As the anterior portion of the lamina is a direct continuation of the chorioid, we may assume that an atrophic process running its course in the latter would also involve the elastic tissue and thus lead to the excavation.

The atrophic process in the chorioid is to be regarded as the cause of the functional disturbances occurring in simple glaucoma. The diminution in the light sense is a result of this process and the malnutrition of the rod-and-cone layer which it causes. The contraction and other defects in the field, as well as the diminution of central vision, are the gradual degeneration of the rods and cones. Since this atrophy of the chorioid, as a rule, extends to the elastic fibers of the lamina

cribrosa, the latter lose their power of resistance and the intraocular tension causes an excavation. The excavation of the disc is indeed one of the most constant and most characteristic symptoms of simple glaucoma and is independent of the existence or non-existence of increased tension.

Increased tension is frequent in simple glaucoma and is the chief feature of inflammatory glaucoma, and may be explained in the following way as a result of the chorioidal atrophy.

In glaucomatous increase of tension three factors are at work: the paralysis of the muscular network of the chorioid, causing a slowing of the currents of liquid; the channels of exit which, in consequence of the retarded flow, through the deposit of the formed elements, become blocked and cause a retention of the ocular liquids; and finally, the anatomical arrangement of the venae vorticosae, which are compressed by the increased tension and thus lead to a general venous stasis with all its results. Each of these factors may affect different persons in different ways and thus give rise to different manifestations of glaucomatous increased tension. The paralysis of the muscular network may be more or less intense. It may develop quickly or require years. The channels of exit may present great variations; sometimes they are wide and straight and are blocked with difficulty, and sometimes they are narrow and tortuous and are readily blocked. Sometimes the mouths of the veins are readily compressed, and again they remain free and open. When all these factors work together in one and the same unfavorable direction, arise the stormy acute inflammatory malignant glaucomas which resist every therapeutic effort and destroy the eye within a short time. If the conditions are less favorable, inflammatory glaucoma may of its own accord, or from eserine treatment, pass off altogether or pass over into simple glaucoma. When the conditions for venous stasis are relatively good, it may happen that the circulatory disturbances appear in a very mild form, or are absent as in simple glaucoma. In fine, all the manifold forms in which acute and chronic glaucoma appear may be explained readily by the various ways in which the factors work together or in opposition."

The name inflammatory glaucoma is misleading, as the condition is the result of a venous stasis. "The stasis may

in certain acute cases extend to the conjunctiva and give rise to chemosis. An injection more or less pronounced of the circumcorneal veins is always present. The venous stasis in the iris and ciliary body causes an increased transudation and a haziness of the media, but excites no inflammation. In fact, however, none of the symptoms which characterize inflammatory iridocyclitis are found in acute glaucoma, excepting only the circumcorneal injection, which here is of a different character. The pupil is not small, synechiae are absent, the cloudiness of the aqueous differs from that in iritis, and the "inflammatory" symptoms vanish in a few hours under the use of eserine, which certainly would not be the case if an inflammation existed, hence it should be called conjunctive glaucoma.

In acute conjunctive glaucoma the diminution of vision is to be regarded as a result of increased tension and at first is always of a functional nature.

In simple glaucoma the matter is somewhat different: here the disturbance of function, when it has gone so far that central vision and the field of vision have been reduced, always depends upon an atrophy of the corresponding nerve elements. The difference in the two forms of glaucoma depends upon the difference in development in congestive and in simple glaucoma.

In simple glaucoma, the atrophy is chiefly in the inner layers of the chorioid—in the chorio-capillaris. The nervous elements—the rods and cones—are early affected and with the insufficient nutrition soon are destroyed. If with this is associated an atrophy of the elastic fibers of the retina with excavation of the disc, the nerve fibers also begin to be affected, and this hastens the diminution of vision.

If the atrophic process begins in the outer layers of the chorioid without involving the chorio-capillaris, there arises an acute congestive glaucoma which, if relieved, can recede to the normal function of the eye and an apparent restitutio ad integrum. Since the chorio-capillaris is healthy, the retina functionates normally and the acuteness of vision remains normal. The eye may therefore, despite a congestive glaucoma, if a successful iridectomy is done, present for years the appearance of a healthy eye. The atrophic process continues, however, rapidly or slowly, and finally affects the chorio-capillaris and with it the nervous elements of the

retina. The disease then assumes the character of a simple glaucoma.

From what has been said, it is evident that the prognosis of glaucoma in general must be considered bad, because we have no remedies which will act upon this atrophic process. But since the process differs greatly in different cases, so the prognosis differs greatly. In simple glaucoma the prognosis is always bad. In congestive glaucoma, iridectomy or the use of eserine may relieve the tension in many cases and restore the normal circulatory conditions in the eye. The atrophic process in the chorioid continues however, extending to the chorio-capillaris, and blindness is here also the final outcome. But this may be delayed for many years.

In regard to the treatment of glaucoma, we have not yet been successful in finding a sure means of checking the atrophic process in the chorioid.

Observations are too few and reports too contradictory regarding Jonnesco's sympathectomy.

In simple glaucoma, with little or no increase in tension, strychnine injections, one a day for ten to twenty days, repeated three or four times a year, have enabled me to preserve the vision for many years, although in more than half the cases the diminution of vision has continued unchecked.

In simple glaucoma, there is no indication for iridectomy as a curative procedure; but since an acute congestive attack may come on in a case of simple glaucoma, iridectomy is of prophylactic value, and the operation is more easily done in the quiescent stage than in an acute attack, and as yet remains the sovereign means of reducing tension, although its action is not understood.

"An anterior sclerotomy may doubtless in many cases relieve a glaucoma, but in most cases its action is nil. When the wound heals, the effect of the operation is at an end, and an iridectomy has usually to be made. In fresh cases of acute congestive glaucoma in which for any reason iridectomy cannot be done, frequent instillations of eserine act best in reducing the tension. Sometimes a single or several instillations are sufficient, but usually many are necessary. I have sometimes had to instil eserine forty to fifty times in the course of twenty-four hours in order to reduce the tension. As a rule, I begin the treatment of a glaucoma

with frequent instillations of eserine, and after becoming convinced of its futility I proceed to operation. In this way the congestive symptoms are checked and the operation can be more satisfactorily performed and a better result obtained than when one operates in an acute glaucomatous state."

N. M. B.

Report of a Case of Acute Glaucoma Incited by the Use of Euphthalmine for Diagnostic Purposes.

RING, HENRY W., New Haven, Conn. (*Med. News*, Nov. 7, 1903.) The writer tells of the introduction of euphthalmine by Treutler, in 1897, as a strong mydriatic, brief in its action, and producing no unpleasant effects, and summarizes Treutler's experimental results as follows:

1. The instillation of euphthalmine solutions into the eye causes only very slight and temporary inconvenience.

2. Euphthalmine is a powerful mydriatic. A five to ten per cent. solution produces a maximum dilatation of the pupil in about the same time as does one per cent. homatropine solution.

3. Its action is less intense and prompt in the aged than it is in younger individuals.

4. Euphthalmine has the advantage over cocaine as a mydriatic that it is more powerful in its action, and that it does not damage the corneal epithelium. On the other hand, the mydriasis which it occasions is somewhat slower of development.

5. Euphthalmine affects accommodation less than does homatropine.

6. Both the mydriasis and the accommodation paralysis disappear much more quickly after its use than after that of homatropine.

7. No unpleasant effects upon the organism have so far been observed from its use.

These observations were confirmed by other observers and the drug has come into very extended use. Knapp received the impression that it had the tendency to increase eyeball tension, and Jackson was skeptical concerning the claim of its being free from the danger of causing glaucoma.

The writer has been using a 5 per cent. solution of euphthalmine during the past three or four years for dilating the pupil for diagnostic purposes; he had however made it a cus-

tom before using it in a patient beyond middle life, to test the tension, examine the eye by oblique illumination, and make some inquiries as to the glaucomatous symptoms. He has never had occasion to regret the use of this mydriatic except in one instance which forms the basis of this paper the history of which is given:

A woman of 56 was sent to him for an examination of the eyes in order to discover the cause of headaches which had troubled her for many years, and of periodic attacks of pain in the left eye. The eyes seemed normal; tension and the fields were normal; there was a moderate amount of hyperopia and hyperopic astigmatism. Two drops of a 5 per cent. solution of euphthalmine were instilled into the left eye; in half an hour the pupil was well dilated. Within a few hours after leaving the writer's office, there was pain in the left eye and left side of the head; during the next two weeks she had but few intervals of relief except under the influence of an opiate; the eye soon became inflamed, tender, and vision much impaired. She was unable to report until two weeks after the instillation of the mydriatic, when she presented a typical case of acute glaucoma. Vision was reduced to distinguishing objects, T one and a-half, eyeball injected and tender, cornea dull and anesthetic, anterior chamber shallow, pupil dilated and fixed, no view of fundus possible. R. E. not involved.

Iridectomy (under ether) was promptly performed; the iris was very rotten and had to be picked out in strands. After the operation the patient was comparatively free from pain. Five days later, T was normal, field good, eye white and quiet, and V. very fair (no record). Ten days later: no recurrence of trouble, Tn., media clear, slight cupping of disc. V. 20/50 +; 20/20 — with + 1.12 D. \ominus — 1.00 D. Cyl. Vert., and J. 2 with + 4.00 D. Sph. \ominus — 1.00 D. Cyl. Vert. During the next four months there were occasional shooting pains through the left eye and head, but only such as she had been having for two years or more previously. During the past winter, she has been comfortable and V. is normal with correcting lenses. The eye is free from plus tension, and there is no cupping of the disc. C. H. M. .

The Bacteria Concerned in the Production of Eye Inflammation.

RANDOLPH, ROBERT L., Baltimore. (*Jour. Amer. Med*

Assn., Oct. 3, 1903.) "In the group of micrococci we find the *Streptococcus pyogenes* the *Staphylococcus aureus* and *albus*, the pneumococcus and gonococcus. In the group bacilli, we have Weeks' bacillus, the diplobacillus of Morax-Axenfeld, the diphtheria bacillus, xerosis bacillus, tubercle bacillus, *Bacillus Pyocyaneus* and colon bacillus. Several of these bacteria are often found in the normal conjunctival sac, and the *Micrococcus epidermidis albus* may be regarded as an almost constant inhabitant of this location, and to a somewhat less extent this is the case with the xerosis bacillus. These two bacteria, then, cannot be regarded as actually pathogenic for the human conjunctiva."

The colon bacillus is another organism which is not generally considered pathogenic but there is sufficient evidence to warrant the belief that it does become very pathogenic under certain circumstances.

"These three organisms, then, are the least pathogenic of the group. When we pass to the other members of this family or group the element of pathogenicity comes out stronger, being most marked in the diphtheria bacillus, then in the gonococcus, Weeks' bacillus, pneumococcus, diplobacillus of Morax-Axenfeld, tubercle bacillus, streptococcus and *Staphylococcus aureus*. The latter organism, as it is found so frequently associated with a normal condition of the conjunctiva and lids, may almost be classed with the three organisms which I have indicated as being relatively less pathogenic. The streptococcus is another organism which is most constant in its effects. At times it will seem to have little, if any, virulence, no matter how tested, while again it exhibits very marked pathogenic properties. When found as the active factor in an ophthalmia we usually have a very intense reaction, as seen in the streptococcus diphtheria of the conjunctiva, also in Parinaud's conjunctivitis.

All these organisms, however, irrespective of their pathogenicity, require to some extent a helping hand to render them capable of doing harm. While it is impossible to demonstrate always the exact nature of this co-operative agency, it is almost certain in a great number of cases that it consists in an abrasion or injury of the epithelium. Whatever lowers local resistance favors the multiplication of any bacteria which might happen to be in the conjunctival sac, and in overwhelming numbers ordinarily harmless bacteria

can become dangerous. The more pathogenic an organism the greater would be the odds against the eye in case of mechanical injury, and I am convinced that the freedom of the eye from suppuration after penetrating wounds from accidents as well as operations, while due in larger measure to the natural resistance of the eye to the disease, is also to no little extent due to the feeble pathogenic properties of those bacteria which are so often found in the conjunctival sac. No matter how pathogenic the bacteria if they fail to multiply it means that the battle is not to them. The sooner we realize, in dealing with the normal conjunctiva, that the latter is adequately equipped for adversity, the better will be the results of our operative work, and I look forward to no distant day when antiseptic irrigations of the normal conjunctiva in cataract operations will have been generally abandoned, and I am sure that during the past few years there has been a steady growth in the realization of the principle, clean hands, clean instruments, clean cocaine, and leave the rest to the tissues of the eye. These rather practical thoughts suggest themselves to me in speaking of the bacteria which are found in the normal conjunctiva. I am convinced that with increasing knowledge we will be compelled to take up another position, even perhaps to regard some of the bacteria which are found in our bodies as benefactors, as blessings in disguise." N. M. B.

The Essentials and Non-Essentials of Ophthalmic Asepsis.

GIFFORD, HAROLD, Omaha, Neb. (*Journ. Amer. Med. Assn.*, Oct. 3, 1903.) "There are two fundamental propositions which should be kept in mind in our attempt to do aseptic eye surgery. First, that the conjunctival sac in the great majority of cases, and probably always, contains germs which are pathogenic, or which can, under certain conditions, become so.

The second premise to keep in mind is that to rid the conjunctival sac of these germs is a practical impossibility. This fact has been asserted often enough, but many operators still seem to dote on the idea that by rinsing out the sac with sublimate 1 to 5,000, or some other equally harmless mixture, they can obtain an aseptic operative field.

If there are any who believe in the efficacy of such measures they need only make a few cultures from the retrotarsal

folds of eyes that they have thus prepared for operation, to be convinced of their error.

The lashes also are a favorite abiding place for bacteria. The main body of the lashes can apparently be freed from germs by thorough scrubbing with fat-dissolving agents, but none of these has any marked influence on the germs gathered about the roots of the lashes.

Starting with these premises, it is evident, I think, that a certain share of the precautions which general surgeons are apt to consider necessary, can, for the ophthalmic surgeon, be regarded as unessential or even to a certain extent detrimental.

The tear passages are a constant possible source of infection; they can be cut off by one means of obliteration or another, as cautery, ligature, or extirpation. The bath is unnecessary, except for the purpose of ordinary personal cleanliness, and, if enforced, may lead occasionally to serious trouble."

"With regard to the preparation of the skin of the eye lids it is obvious that the vigorous measures frequently employed in surgery to rid the skin of germs can not be used to advantage here, and unless the operation actually involves the skin, it is questionable whether the latter really needs any special attention, although there can be no objection to any such cleansing as can be done without irritating the eye. Where the skin of the lids is involved, besides scrubbing it carefully with sterile swabs, I think it advisable to paint the skin with 4 per cent. silver, allowing the latter to dry on.

For cleansing the lashes, the safest plan in all operations on the globe is to cut off the lashes and, after scrubbing the roots with benzine swabs, to anoint them with an oxid of zinc or some other stable ointment, so as to hold in the germs which are invariably left on them.

"The lid margin can apparently be temporarily sterilized by wiping it carefully with sterile swabs.

The preparation of the normal conjunctiva, for an operation on the globe, should be conspicuous for its simplicity or even absence.

As an irrigating fluid, a freshly made and freshly sterilized normal salt solution is probably the least objectionable, but in practice I generally use a boracic acid solution, since the salt solution, if kept in stock, is more apt to permit a growth

of fungi which, though easily killed, might nevertheless render the solution somewhat irritating and unstable, while the boracic acid solution, if kept in a vessel with a layer of undissolved crystals at the bottom, is practically free from such growths.

Anything in the way of a preparatory bandage is to be abjured. Numerous experiments have shown that these always increase the number of germs in the normal sac. With regard to tear passages, if there is any obstruction in the duct or inflammation of the sac, preliminary treatment should, of course, be instituted if there is a reasonable chance of restoring normal conditions in a short time; otherwise, as a preparation for a cataract extraction, it is probably better to extirpate the sac or close up the tear points with the galvanocautery. In the case of patients who can be seen several days before a cataract extraction, I believe it is a good routine to slit the upper tear points slightly and inject some indifferent solution in order to be sure of the patency of the duct and the freedom of the sac from even minute quantities of pus; but where the patient must be operated on within twenty-four hours or so, if the conjunctiva seems perfectly normal and there are none of the ordinary signs of obstruction of the duct or inflammation of the tear sac, this precaution may be omitted, since it is almost impossible to dilate either punctum without abrading the membrane; and any such abrasion until entirely healed over, may furnish the breeding place which will convert a tolerable innocent germ into a pathogenic one.

With regard to the bandage, there are, I think, very few who believe in using absolutely no protection for the eye after a serious operation. Whether to leave the eyelids entirely free under some sort of a shield is a more open question. It seems to me that it is decidedly easier for a patient to keep his eye still if a gentle uniform pressure is exercised on the lids, and the quieter the eye is kept for the first twenty-four hours and perhaps longer, the smaller the chance of secondary infection.

The experiments of Genth indicate, as one might *a priori* conclude, that the sterilization of the bandage materials is a matter of little moment.

The writer uses next the eye, after all serious operations, a layer of cotton, which has been freshly boiled for ten min-

utes in a boric acid solution, which is covered with rubber tissue to keep it moist, as it furnishes better drainage than dry cotton or a dressing with some stable ointment

The best protection from external violence can only be secured by using one of the various shield dressings which provide an arch of some firm material, whether it be pasteboard, celluloid, gutta-percha or metal; and to secure safety from the patient's fingers, nothing approaches the certainty afforded by pasting down the edges of the shield or bandage with thin strips of absorbent cotton and collodion.

Instruments should be boiled for ten minutes in a one per cent. solution of carbonate of sodium, the knife blade wrapped in cotton; the boiling water is poured out of the vessel, and the heat retained by the instruments quickly dries them; the cover should then be replaced and left until the operation begins.

Collyria may, of course, be sterilized by boiling, but as cocaine solutions lose their strength when boiled repeatedly, I sterilize a small quantity immediately before each operation, by suspending the tube which contains it in a pan in which the swabs for the operation are boiled for ten minutes.

The management of the thread to be used for sutures is one of the most difficult tasks which the surgeon who wishes to be aseptic has to encounter. The threaded needles can be boiled with the other instruments if the silk be wound on bits of rubber tubing to keep it from getting tangled; but in introducing sutures into the conjunctiva it is very difficult to keep the thread from touching the lashes or skin of the eye lids, even if the patient wears a gauze mask. With regard to the person of the operator, for the oculist it seems to me that anything beyond a good scrubbing with sterile soap and water and a careful drying on a sterile towel is a waste of time except in the rare cases mentioned. With regard to the dress of the operator, a surgical gown or jacket presents a good appearance and may be of some use, but it is far less essential than some form of protection of the nose, mouth, beard and hair, partly on account of the danger of dandruff falling directly on the operative field, but chiefly to hold back the germs from the nose and mouth which, as Flugge and his pupils have shown, are constantly shot out into the air while talking, coughing or sneezing. It is tolerably easy to have caps with face pieces made for this purpose, but

nothing is so simple as a double thickness of gauze, about eight inches broad and a yard long. The center of this is placed over the nose, mouth and chin, and the ends crossed behind the head and brought around so as to cover the vertex and forehead as well."

N. M. B.

A Hitherto Undescribed Membrane of the Eye and its Significance.

VERHOEFF, FREDERICK HERMAN, Boston. (*Boston Med. and Surg. Journal*, October 22, 1903.) While studying the external limiting membrane of the retina in a section of a normal eye, the writer found a hitherto undescribed fenestrated membrane in the pigment layer, identical in structure and staining reactions with the membrane limitans externa. "The appearance presented by this membrane in cross section is that of a delicate line running along near the inner margins of the cells, the latter projecting beyond it in the form of processes of variable length. Occurring at almost regular intervals on the line there are black dots, each of which on close examination is found to be situated at the line of junction of two cells. On careful focusing it can be seen that the line is not always on the same level, evidently passing sometimes behind and sometimes in front of the cells. Rarely it is missed entirely for a cell or two. In oblique sections the true structure of the membrane is at once apparent, the latter appearing then not in the form of a straight line, but as a series of hexagonal loops which are fused together at their sides of contact so as to form a screen into the openings of which the pigment cells project. The little dots resolve themselves into the sides of the loops, which in cross section had pointed more or less directly at the observer.

That this is a true fenestrated membrane, and is not an appearance produced by the contours of the cells, there can be no doubt whatever. In the first place, as just stated, it does not correspond in position to the margins of the cells. Secondly, in phosphotungstic acid hematoxylin followed by acid fuchsin it stains blue, whereas the cells stain pink or not at all, and show no vertical lines between them. Thirdly, in certain places where two neighboring cells have shrunk apart, it remains intact. Fourthly, it can frequently be seen projecting beyond a fragmented portion of the pigment layer,"

For years the external limiting membrane has been considered from either by the opposition of the outer ends of Müller's fibers or by lateral interlacing offshoots from them—a view still held by Greeff; the basis of this belief seems to rest on the fact that Müller's fibers have been seen to end in contact with the external limiting membrane. Since, however, an entirely similar membrane, and one with which it is directly continuous, exists in the pigment layer, where there are no such fibers, the writer feels that this theory must be abandoned; he regards the processes which have been described as arising from the membrane and passing in between the rods and cones so as to isolate them as nothing but the cut ends of loops seen obliquely, and the appearance of other little processes extending inward as due to the sharp contours of the cones.

"No one can doubt that the membrane in the pigment layer is a product of the cells which project through it. It seems clear, therefore, that the membrane *limitans externa* must have a similar origin. The latter membrane, however, makes its appearance long before the rods and cones are formed, so that it must be manufactured by cells which later become converted into these elements. The natural deduction from these conclusions is that the rods and cones and the cells of the pigment layer are essentially of the same nature, and that the former are only modified spongioblasts (of his). Two facts already mentioned support this deduction: one is that at the margin of the optic disc the rods and cones can sometimes be seen gradually to assume the character of the pigment cells, and the other is that the *membrana limitans externa* gives the characteristic staining reactions of neuroglia. The writer has found, too, that the rods and cones, and frequently also their nuclei and fibrils, can be differentiated from the bipolar cells of the retina by the neuroglia stain. The theory that the rods and cones represent modified ependymal cells is not new, but it seems to the writer that the foregoing considerations make this theory practically a certainty. It is interesting that this supports Barker's contention, based on analogy, that the rods and cones are not nervous elements but sensory epithelium and that the bipolar cells of the retina correspond to the cells of spinal ganglia."

Verhoeff studied sections of glioma retinae in order to

determine the structure of the limiting membrane in the rosettes found in this growth. Such sections showed conclusively that the membrane in the rosettes is a fenestrated structure similar in every way to the external limiting membrane and to the membrane of the pigment layer. The fenestrated structure of the membrane seemed to explain the formation of the rosettes, for when a few cells became bound together by such a membrane, and they were otherwise unhampered in their growth, they would be compelled to form a more or less spherical body.

"The similarity of the rosettes of glioma retinae to the layer of rods and cones, the neuro-epithelium of the retina, was first pointed out by Flexner and a few years later by Wintersteiner. Each observer suggested the term "neuro-epithelioma" as the proper designation of these tumors. A strong argument against the theory of Flexner and Wintersteiner in regard to the nature of the rosettes is the fact that according to accepted views the membrane of the rosettes could not be formed in the same way as the membrana limitans externa, since there is nothing corresponding to Müller's fibers in these bodies. Strangely enough this fact seems to have been entirely overlooked. The observations of the writer, however, render this objection no longer valid, for it has just been shown that the membrana limitans externa is in all probability produced by the cells which go to form the rods and cones. It was pointed out, too, that the two membranes are identical in structure.

While, then, the nature of the rosettes in glioma retinae seems plain, the character of the other elements in these tumors is still undetermined. Thus far there is no trustworthy evidence that the cells are differentiated into true ganglion cells or neuroglia cells. Greeff claims that by means of the Golgi-Cajal method he has not only demonstrated several types of ganglion cells but neuroglia cells as well. If ganglion cells can be found in cheese by the Golgi method, it is not surprising that they should have been found in a tissue so prone to undergo degeneration as in glioma retinae. Then, too, the ganglion cells and neuroglia cells belonging to a portion of the retina incorporated in the tumor might easily be mistaken for elements of the tumor itself. By Mallory's method the writer has been unable to find neuroglia fibers in these tumors which were not connected with the

retina. Brown Pusey has recently described a case that he evidently regarded as glioma retinae, and has arrived at the conclusion that glioma retinae consists essentially of neuroglia elements. He also concluded that the limiting membrane of the rosettes corresponded to the internal, not to the external limiting membrane of the retina. Judging from the description of the case, however, the writer is very sure that it was really one of phthisis bulbi posterior following metastatic ophthalmitis, one of the conditions known clinically as pseudo-glioma. The "rosettes" were evidently nothing more than retinal folds.

Since there is no reason to believe that these tumors contain neuroglia, the writer points out the fact that the term "glioma retinae" is obviously an inappropriate one. But this criticism also applies to the term "neuro-epithelioma:" if the latter designation merely indicated the origin of the tumor from the epiblast of the neural canal of the embryo it would be a suitable one; but since, unfortunately, the term "neuro-epithelium" has been applied to the layer of rods and cones in the fully differentiated retina, the word "neuro-epithelioma" would indicate a tumor whose essential elements correspond to the rods and cones. As a matter of fact it is rare for the rosettes to form more than an insignificant part of the tumor and in most of the examples they are entirely absent; it is possible, if not probable, that they do not represent the only form of differentiation and that the essential elements of the tumor may undergo differentiation in other directions as well; many of the elements may possibly represent neuroblasts. Both methods of designating this variety of growth being improper, it would seem wiser, for the present, to adhere to the older one "glioma retinae."

C. H. M.

The Various Methods of Preserving and Mounting Gross Eye Specimens.*

WOOD, CASEY A., Chicago. (*Jour. Amer. Med. Assn.*, Sept. 26, 1903.) The various means of preserving micro-

*Report of the Committee on Exhibit of Pathologic Preparations at the Section on Ophthalmology, American Medical Association, New Orleans, May 5-8, 1903. Casey A. Wood, Chairman; H. V. Würdemann, and E. A. Shumway.

scopic specimens is described, and methods used by the Ophthalmic Section of the American Medical Association are detailed. The methods giving the best results are the Priestley Smith glycerin jelly mount and the Greeff mount in a fluid preservative, as a 3 per cent. formalin or Kaiserling solution.

The Priestley Smith method, briefly, is to harden the enucleated eye for 24 hours in a 10 per cent. formalin solution, transfer to a weak alcohol solution, 25-50 per cent., increasing the strength about 10 per cent. daily until 80 per cent. is reached, where it can remain until ready to mount, when it is placed in ten to twenty times its volume of water for 24 hours to remove the alcohol; then freeze in salt-ice mixture, after wrapping in waxed paper or oil silk; divide with sharp knife, place in distilled water to thaw for 10-15 minutes, then place in 5 per cent. aqueous solution of chloral hydrate 24 hours, 33 per cent. glycerin and water for 24 hours, and, finally, in 50 per cent. glycerin and water for 24 hours, when it is ready to mount.

"Glycerin jelly is prepared by taking 30 gm. of best gelatin (Gold Label, American; Coignet et Cie, France; or Conte Fils, Germany), adding 240 c.c. of distilled water and heating over a water bath. The whites and shells of two white-shelled eggs, or a small amount of Merck's egg albumin, is added and constantly stirred until the coagulated albumin rises to the top, leaving a clear liquid underneath. Filtered through two thicknesses of good filter paper, add an equal volume of C. P. glycerin, 10 c.c. of a 10 per cent. solution of carbolic acid being added to each liter of the jelly to preserve it. The jelly itself is melted by placing the container in hot water, when ready for mounting."

After mounting in the jelly, the mount is exposed to the fumes of formalin under a bell jar, after first being exposed to the drying effects of calcium chlorid to more thoroughly dry the specimens.

With the Greeff method the eye is prepared in the same manner. The following are necessary in addition to the glass jar for mounting:

- "1. A 3 per cent. formalin or Kaiserling solution.
2. Some gelatin glue. Dissolve three or four strips of ordinary cooking gelatin in an equal bulk of water and boil until the mass is thick and tenacious. It is then ready for

use. On cooling, the solidified mass may be preserved for future use by adding a little alcohol; heat will promptly liquefy it.

3. Some shellac or japanner's gold size; "liquid glass" to seal the cover. The gelatin glue will answer this purpose very well unless the mount is to be sent through the mails.

The technic is not difficult. Carefully dry the half or one-third section of the eye, lay the jar on its side, put a drop of the gelatin glue inside, and place the specimen in position. Allow the glue to harden for fifteen minutes; place the jar upright, fill it with the solution and seal the cover. A small clasp may now be glued to the cover to carry a label or photograph.

The advantages of this method, especially over the Priestley Smith method so generally used in past years, are obvious, namely:

1. The Greeff method is quicker. It takes several days to prepare the gelatin, mount the eye and allow the jelly to harden according to the Priestley Smith method. The writer has mounted as many as twenty eyes by the Greeff method in a single morning.

2. The method is simpler and the mount more permanent. A good clear gelatin of the right consistency which will retain its solidity in hot weather is difficult to obtain.

3. It is cheaper by two-thirds. The Greeff jars may be had of E. Leitz, 34 S. Clark street, Chicago, for 10 cents each. The Priestley Smith jar costs 30 cents. * * *

4. The Greeff mount may be kept on a shelf exposed to the light indefinitely, while any gelatin mass will discolor in time.

5. Eyes preserved in formalin or Kaiserling are easier to imbed and section for subsequent microscopic study, should this be at any time desired."

N. M. B.

An Ophthalmic Treatment Outfit.

POSEY, W.M. CAMPBELL, Philadelphia. (*Jour. Amer. Med. Assn.*, Oct. 3, 1903.) This consists of a series of bottles, contained in a nickel-plated caster-like holder, which in its turn rests in an enameled pan. The bottles are five in number; one with a capacity of four ounces, holds a boracic acid or other mild antiseptic solution for the purpose of flushing the eye; the other four are one-ounce bottles and contain such

drugs as may be required. Each bottle is provided with a pipette, which serves as an accurately fitting stopper, and also with a glass cover, to further prevent the entrance of germs or dust into the bottle or dropper.

By this arrangement there is secured for each patient in hospital service a complete set of bottles for his individual use.

The pan is intended to hold ice when ice compresses are to be applied, or as a vessel in which to heat the water, when hot compresses are desired. The pan is attached to the caster-like holder by a double spring, and although the outfit is intended to rest on the table at the bedside, it can be carried about if occasion demands. The various parts of the outfit can be readily sterilized and may be used in successive cases,

Best Methods of Counteracting Psychoses Due to the Strain and Stress Incident to Our Public School Methods.

HERDMAN, WILLIAM JAMES, Ann Arbor. (*Jour. Amer. Med. Assn.*, Nov. 14, 1903.) In the course of this paper the author makes the following remarks about the influence of errors of refraction:

Among the physical defects to which attention has been more especially directed * * are the abnormalities of the special senses, chiefly those of sight and hearing, since these are the main avenues by which the world of sense finds entrance to the world of mind. * * *

He details results of examination of school children's eyes in this and other countries and questions whether they had healthy eyes on entering school, and shows that the eyesight of from one-fourth to one-third of all school children is defective, and, moreover, such defect has in many instances been brought to the knowledge of both teacher and parent for the first time by those inspections instituted by physicians.

Whether or not the production of this large percentage of cases of impaired vision can in any measure be charged to school methods or defective school hygiene must, I think, for the present be left an open question. It is for the present sufficient, perhaps, for us to know that such a large share of school children at an early age are handicapped by serious deficiencies in the mechanism of one of the most important

senses through which knowledge is acquired, and that often such deficiencies remain unrecognized and uncorrected, so far as such correction is possible, by both parent and teacher.

Now, it is needless for me to recall the fact that eyestrain is one of the quickest and surest means of bringing about brain exhaustion and mental fatigue, and that out of the fruitful soil of mental fatigue, all manner of psychoneuroses spring up. What would appear, and in reality be, a very simple task to a child healthy in every organ, might in one with defective vision produce a strain and stress that would cause an unhealthful drain on the entire store of nerve energy and so result in disorder of normal function in certain of the more susceptible parts.

There are conditions existing in many school rooms which are injurious to the eyesight aside from the prolonged and, perhaps, unnecessary confinement to the printed page. Dim or misdirected light, the distance of the pupil from the visual demonstration on the black-board, defective ventilation and temperature of the room are causes which may contribute very considerably influences that attend it outside of school hours. Only by having such knowledge can we properly estimate the effects of school conditions for good or evil. He suggests:

1. A careful medical inspection of school children at the beginning of their school life and stated intervals thereafter, covering both their physical and mental capacities.

2. All teachers should be well instructed in the physiology and psychology of the child and in the principles of school hygiene.

3. School buildings and their environments should be made to comply with all the requirements of modern school hygiene, as to light, pure air, temperature, seating, decorations, play ground facilities, etc.

4. The curriculum should be so flexible as to allow more opportunity for the exercise of the individual judgment of the teacher, as to the best method to adopt for each child in order to secure for it the greatest educational value, and the curriculum should include facilities for appealing to the mental faculties along every sensory pathway, among which facilities I would mention nature study, rational kindergarten, manual training and physical exercise.

5. The number of pupils assigned to any one teacher

should be only such as she can care for to the best advantage. Time should be allowed the teacher for a careful study of the physical and mental needs of each pupil.

6. A closer relationship between the parent and teacher, with a view of securing the end sought—the highest and most useful development of the child.

7. The removal, as far as possible, of all conditions within or without the school room that interfere with the accomplishment of this purpose.

H. V. W.

On the Structure of the Outer Segments of the Rods in the Retina of Vertebrates.

HOWARD, ARTHUR D. (*American Naturalist*, August, 1903), used chiefly *Rana Pipiens*, the common leopard frog. He found the outer segments of the rods in the retina of the frog contain each an axial core that differs from the peripheral substance, but the exact nature of this core has not yet been made out. The outer segments, as demonstrated by the use of the polarized light, are positively anisotropic and agree in this respect with the axis cylinders of nerves. These outer segments therefore, give evidence of containing longitudinal fibrillae. Since they also show in the free state a transverse banding, their structure is in some respects not unlike that of a cross-striped muscle fiber in that in addition to a cross banding they also possess a longitudinal fibrillation.

E. E. B.

Syphilitic Lesions of the Eye.

JACKSON, EDWARD, Denver, (*Denver Medical Times*, Dec., 1903), mentions the various eye lesions of syphilis and notes their frequency, their diagnostic significance, their value in the prognosis of the severity of the syphilitic infection and their treatment, local and constitutional.

As regards the frequency of chancre of the lids or conjunctiva, he considers it rare enough to be readily overlooked and states that among 200,000 patients applying at the Wills Eye Hospital in Philadelphia, only 35 were suffering from syphilitic ulcer of the lids or conjunctiva, and only a small proportion of those were primary. Among all cases of acquired syphilis less than 3 per cent. show iritis, and the character of the inflammation cannot be regarded as pathognomonic. In discussing the prognostic significance of

syphilitic eye lesions, the author says that any cases presenting them should be regarded as of more than average severity, and quotes some statistics from Trousseau to the effect that out of forty cases of syphilitic iritis two died of syphilitic lesions; twelve suffered from tabes; eight from cerebral syphilis; three from general paralysis, and nine from lesions outside of the nervous system.

W. R. M.

When Not to Prescribe Cylinders for Astigmatic Eyes, and When to Prescribe Them for Non-Astigmatic Eyes.

STEELE, N. C., Chattanooga. (*Ophthalmic Record*, Dec., 1903.) When not to prescribe cylinders for astigmatic eyes: The author states that the general rule of correcting all the astigmatism holds good in cases of simple astigmatism of low degree and of astigmatism of low degree combined with a low degree of spherical error which requires lenses for distance, or for both distance and near. Gives as exceptions to this rule those cases requiring for near use, strong spherical lenses, and those cases that require a sphere combined with a cylinder, axis horizontal. The reason given for these exceptions is that in looking obliquely through a spherical lens, as in doing near work, one gets a spherocylindrical effect with the cylinder axis horizontal. Hence, he concluded that when lenses are to be used for near work only, many cases of astigmatism with best meridian horizontal should not have the astigmatism fully corrected. The above exceptions applying especially to strong cylinders with axis horizontal.

In prescribing astigmatic lenses, axis horizontal, for near work, the writer is guided by the following rules: If the astigmatism is of low degree he omits entirely the cylinder; in high degrees of astigmatism he omits a part of the cylindric element, the amount deducted depending upon the strength of the sphere and the degree of astigmatism present. With hyperopic astigmatism the best meridian vertical, full astigmatic correction is given. With spherocylindric lenses, for near work, axis vertical, the cylindric power should be increased, increase to be governed by same general estimate as in the opposite condition.

Cylinders for non-astigmatic eyes: In prescribing strong plus spheres for near use when there is no astigmatism pres-

ent a $+ .25$ D to $+ .75$ D cylinder, axis vertical can often be ordered with advantage.

Is Double Operation for Senile Cataracts Justifiable?

HANSELL, H. F., Philadelphia (*Ophthalmic Record*, Dec. 1903), believes the double operation to be justifiable under the following conditions: That the vision of each eye is so diminished that the patient is debarred from his usual occupation and is consequently unable to earn a living; that both cataracts are ripe enough to warrant extraction, or that either lens might be operated upon with equally good chances of a favorable result; that nothing in patients mental or physical state might militate against recovery; that the cataracts are not secondary to local or general disease; that the extraction of the first lens was accomplished without accident or indications of complications should operation on the second eye be attempted.

The author mentions five double extractions, operated by himself, and expresses the belief that in properly selected cases the double extraction can be done with advantage to the patient.

W. R. M.

Conical Cornea—An Historical Review Together With a New Non-Operative Method of the Treatment.

FOX, L. WEBSTER, Philadelphia. (*Ophthalmic Record*, January, 1904.) The author of the above article gives an historical review of the subject of "Conical Cornea," and cites literature on this subject from the earliest publications up to the present time. He discusses also the symptoms and etiology of this condition. Under the treatment, he reviews both operative and non-operative treatment, and under the latter cites a clinical case in which vision was brought to 6/9 and 6/12, and work at close range was comparatively easy when a disk with a smaller aperture was employed. In this particular case a series of experiments extending over a period of several years were performed in an effort to adopt some form of disk that would permit rays of light to enter the eye through the least refractive portion of the cornea. The investigation began with a pinhole disk and stenopaic slit, and included the testing of every form of prism and patch until a satisfactory result was obtained. From this case the following conclusions were reached:

1. That the character of the disk and its angle vary in each case.
2. That the intelligence of the patient is an indispensable adjunct in the selection of the necessary disk, as the method is almost entirely subjective.
3. That lenses in which the corneal area is screened by black patches of various sizes and shapes, containing the requisite slits are better adapted for this purpose and are less noticeable than prisms or ground glasses.
4. That the refraction of the cornea varies from time to time, requiring frequent examinations with changing of the disks.
5. That the incorporation of the patches with the correcting lenses gives rise to an additional improvement.
6. That the only disadvantage lies in the fact that the patches do not correspond to the cornea during ocular movement, but this is compensated for by the marked improvement and comfort afforded when the eyes and disks are adjusted for some average range. .
7. That a fair trial should be made with these disks before resorting to operative procedure. W. R. M.

A Contribution to the Macular Changes in Contusion of the Eye, and Their Forensic Significance.

NAGEL, C. S. G., M. D., San Francisco. (*Occidental Medical Times*, San Francisco, Dec., 1903.) The author details the clinical history and ophthalmoscopic findings in a case of contusion of the eye which was followed by partial loss of vision and relative scotoma. The visual acuity later improving from 6/15 to 6/7.5. When the patient was first seen by the writer, about three weeks after injury, an examination revealed the following; V. F. normal regarding periphery but central relative scotoma present, disc normal in outline, temporal side slightly paler than normal, arteries slightly contracted. In macular region a pale round cherry-red spot of about a disc size and radiating about it small yellowish-white spots without pigment.

Sixteen months later, ophthalmoscopically, fundus appeared normal in disc, vessels, etc. The macular region showed pale brownish-red coloration, a wider area surrounding macula presented a dotted appearance through innumerable

minute, black pigment spots. Visual acuity 6/7.5. Central scotoma present.

The author is of the opinion that a primary edematous condition prevailed for a considerable period, which left slight pigmentary changes behind, but did not interfere materially with other retinal layers, and points out the fact that the case belongs to an intermediate class, between the well marked-evanescent type of Berlin's "commotio retinae," and the cases of graver permanent macular lesions which were first described by Haab, and which tend to become worse, eventually ending in an atrophic area with small residue of pigment. In conclusion Nagel urges the extreme importance of such cases from a medico-legal standpoint and quotes Haab as follows. "The changes sometimes take weeks to appear after the injury, and then, perhaps, are so slight that they seem out of all proportion to the great amount of visual disturbance that may be present."

W. R. M.

Two Cases of Transitory Complete Blindness of Both Eyes.

KIPP, CHARLES J., M. D. (*Journal Am. Med. Assoc.*, D c. 5, 1903.) The first case was one in which there was total blindness of the left eye, an enlarged pupil which did not react to light, and a swollen and enlarged disc. On first examination the right eye showed a vision of 5/12, a normal pupil responding readily to light and a swelling and enlargement of the disc of less degree than in the other eye. In twenty four hours however the right eye was in the same condition as the left. No indication of any constitutional disease could be found. The patient was treated with potassium iodide and after about six days there was perception of light and a decrease in the swelling of the optic discs. The symptoms gradually grew less until at the end of three months the vision was normal and the fundus findings normal. In this case the seat of the injury was undoubtedly in the conducting apparatus, manifest from the fact that the pupillary light reflex was absent during a part of the time the blindness existed. The second case was one of sudden blindness occurring after two or three severe headaches in a patient perfectly well except for habitual constipation. The pupils reacted to light, the movements of the eyeballs were unimpeded, and the fundus was normal. The total blind-

ness continued for about thirty-six hours and then her vision gradually returned. Her temperature was normal during the attack, the urine was free from albumen or sugar, there was no reason for assuming any hysterical element in the case. The complete blindness with prompt pupillary reaction to light seems to establish the fact that the optic centres were the seat of the lesion.

M. D. S.

Physiology of the Sympathetic in Relation to the Eye.

DE SCHWEINITZ, G. E., M. D. (*Jour. Am. Med. Assoc.*, Jan. 30, 1904.) The following conclusions are reached:

1. That the sympathetic should not be considered as the nerve of secretion for the lacrimal gland.

2. That the dilating impulse transmitted to the iris passes through the cervical sympathetic and along the mydriatic tract of the pupil, which proceeds from a center in the medulla as far as the second dorsal nerve, follows its communicating branch to the cervical sympathetic, and arrives at the internal carotid plexus, from which point it passes to the naso-ciliary branches of the nasal nerve, which, as the long ciliary nerves supply the muscular tissue of the iris.

3. That the weight of evidence is in favor of the ciliary ganglion belonging to the sympathetic system. That the oculo-motor does not act directly on the sphincter of the pupil but only in association with its ciliary ganglion. That there is some evidence that the ganglion is related as a center to the pupil movements and that it probably contains cells which are active in the sensibility of the cornea, but no trophic changes have been observed after extirpation of the ganglion. Removal of the ganglion has little or no influence on intra-ocular tension, and its excision is not a rational procedure for glaucoma.

4. That section of the sympathetic or extirpation of the sympathetic ganglion is followed by a fall of intra-ocular tension which probably depends upon vascular and muscular changes. The lowering of tension is more decided after excision of the ganglion than after section of the nerve but is temporary and sometimes lasts for a few days, sometimes for a few hours only.

5. That stimulation of certain areas of the brain cortex causes dilatation of the pupil, and (if the cervical sympathetics are intact) also all the symptoms of the stimulation

of the cervical sympathetic. Division of the sympathetic stops the other symptoms but not the dilatation of the pupil.

6. Sympathectomy or gangliectomy causes the following effects: myosis, narrowing of the palpebral aperture, projection of the nictitating membrane, retraction of the globe of the eye, hyperemia of the vessels of the conjunctiva, increased lacrimal secretion, diminished intraocular tension, certain ophthalmoscopic and microscopic lesions of the eye-ground, and possibly trophic disturbances.

That all the symptoms of section of the sympathetic or paralysis lessen after a time, myosis being the most permanent. Myosis is greater after excision of the ganglion than after section of the sympathetic cord.

M. D. S.

Influence of Resection of the Cervical Sympathetic.

BALL, JAMES MOORES, M. D. (*Journal of Am. Med. Assoc.*, Jan. 30, 1904.) In optic nerve atrophy, the author reports a case of optic nerve atrophy which he had in 1899. The patient was forty-six years of age and in good general condition. The vision of the right eye was reduced to perception of concentrated light and of the left eye was nil. The diagnosis was optic nerve atrophy of right eye and complete atrophy of nerve and retina of left eye. A resection of the right cervical ganglion of the sympathetic was done. The operation was followed by conjunctival congestion, lachrimation, miosis, slight ptosis, and hypotonia. There was no change in the vision and no change in the ophthalmoscopic findings except that a cilioretinal artery in the upper part of the disc had doubled in caliber. The second case was a man of forty years. Vision had been failing for several months. The poorer eye had vision reduced to counting fingers at two feet. On this side the superior cervical ganglion was excised. Vision increased to 20/100. One year later he was heard from; his vision was good and he was following his vocation. A third case (a man of sixty-four years) had been addicted to the use of tobacco and alcohol in excess and had had syphilis. His general condition was good. Vision was R. E. = 0; L. E. = fingers at six inches. Under ophthalmoscopic examination a typical simple atrophy of the optic nerves was found. The left superior ganglion of the sympathetic nerve was excised. Two days after the

operation he counted fingers at twelve feet. About two weeks later he counted fingers at fifteen feet. After this the vision gradually decreased until in a few weeks the patient was in the same condition as before the operation. In treatment of hydrophthalmos by operation on the sympathetic nerve four cases have been reported. The tension was uninfluenced and the vision was not improved. In cases of exophthalmic goiter, due to disease of the cervical sympathetic there are various operations as follows: simple division of the sympathetic; ablation of the cervical sympathetic; simple stretching of the cervical sympathetic; partial resection; partial and extensive resection; total resection; thyroidectomy with partial and total resection. Of all these, complete excision of the cervical sympathetic is followed by a larger percentage of cures than is any other procedure. Nineteen cases of this last operation are reported by Balasescu; in 14, after the second day after operation, the Basedow symptoms disappeared one after another until cure was complete.

M. D. S.

Pathology of the Cervical Sympathetic.

WEEKS, JOHN E., M. D., (*Journal of the Am. Med. Assn.*, Jan. 30, 1904.) Irritation of the sympathetic shows as symptoms: mydriasis, exophthalmos and widening of the palpebral fissure. Paralysis of the cervical sympathetic shows two stages of symptoms: first, myosis, ptosis, decrease of tension, increased lachrimation, injection of conjunctiva, and slight exophthalmos, this is followed by a second stage in which the ptosis remains, the myosis persists or several months, tension becomes normal.

Cases of irritation of the sympathetic are not common but have been found as due to abscess of the neck, pressure of tumors, thoracic aneurism, injuries to the neck, injuries to the spinal cord between the fifth cervical and third dorsal vertebrae. In none of such cases reported in literature could the author find any history of patients suffering from glaucoma as a complication.

After reviewing some of the experiments and findings of others the writer reports five cases of glaucoma in which Dr. Ira Van Giesen made the examinations. Seven ganglia were examined microscopically, including two bilateral operations, thus making five different cases, then control examinations

were made on ganglia taken from subjects as nearly as possible the same age as the operative cases. All of the structures of the ganglia were examined in the following order: 1, the neuron cell bodies for cystologic changes; 2, the pigment granules in the neuron cell bodies; 3, the connective tissue frame-work of the ganglia; 4, the blood vessels; 5, the medullated and non-medullated fibers. As a result of the examinations there are the following findings, that the ganglia seem normal with the exception of an excess of pigment in the neuron cell bodies.

The author quotes Dr. Sidney Kuh's findings in ganglia removed from glaucomatous patients in the service of Dr. W. H. Wilder, as follows: Excess of pigment in the ganglion cells, cells not round, often shrunken, eccentric nuclei, sometimes only the nucleolus visible, cells at times vacuolated, mast cells, vascularity. The author concludes that the testimony is not sufficient to enable it to be said that there is any constant change in the cervical sympathetic peculiar to glaucoma, nor is it sufficient to exclude the possibility of such constant change. He suggests that further and more careful research is necessary, probably along the lines of Dr. Van Giesen, for the purpose of determining the conditions of the processes of the neurons and the cell structure; and a study of the pigmentation of the neurons. M. D. S.

Relationship Existing Between the Ophthalmologist, Otologist, and the General Hospital.

* ALLPORT, FRANK, M. D., (*American Medicine*, Jan. 30, 1904). Dr. Allport makes a few suggestions as to how the general hospital can be best adapted for the peculiar needs of the ophthalmologist and otologist, both for his private operative work and his ward cases. One of the most important moves he says is the appointment of a special ophthalmic nurse, whose term of service in this department should not be less than three months; if it is necessary for her to attend to other cases let them be absolutely clean cases; that the ophthalmic nurse should supervise but not personally attend to the infectious cases, that she should make the rounds with the attending ophthalmic surgeon and should be personally responsible for the cleanliness and sterility of everything on her dressing tray; that she should always be present to observe at all eye and ear operations; that she should learn

to put solutions and ointments in the eye, to irrigate or cleanse the eye without injuring it, to properly adjust a bandage, to use hot and cold applications; to irrigate an ear, to dry an ear and to use a head mirror and aural speculum.

That the eye and ear surgeon should concentrate his work in one hospital and there organize and maintain a live department, that few eye and ear surgeons alone can command enough private operative cases to make of this department a real power in a general hospital, but that two or three surgeons of equal ability working together in harmony can build up a creditable eye and ear department in any hospital and one that will give them reason to ask from trustees any privileges or equipment that may be necessary. An operative clinic on a definite day and hour is one of the surest methods of establishing an eye and ear department, a clinic where two or three surgeons working together can by their combined efforts command enough operative material to interest a class from two to four hours one or more days of every week.

M. D. S.

Hallucination of Vision.

HANSELL, HOWARD F., M. D., (*American Medicine*, Jan. 16, 1904). The author refers to the erroneous mental conceptions derived from diseases of the interior of the eye by which the retinal or nervous stimulus is perverted. Vision hallucinations, he says, may be classified under three varieties, as follows: 1, those that arise from ocular disease; 2, those that arise from localized disturbance of the circulation of the brain; 3, those from organic disease of the cortical centers.

The delusions of sight for which ocular disease is responsible embrace mistaken conceptions of objects in the world of reality and their transformation into other objects that exists only in the world of imagination. As causes for this variety there are mentioned: 1. Errors of refraction; for example, myopic patients have an inaccurate impression of size, distance, color and detail. 2. Ocular muscles. These patients receive two impressions of every object, neither of which is correct. 3. Opacities of the media give various mental impressions; opacities of the cornea give the impression of cloudiness; opacities of the lens, the impression of a fog; minute scattered vitreous opacities are extremely deceptive

and give impressions of flies, spiders and flying specs. 4. Disease of the retina, chorioid and optic nerve cause the field of vision to be occupied by brilliant meteoric displays of flashes and circles of light. The perversion and distortion of objects is the result of imperfectly formed images on diseased patches of the retina. M. D. S.

The Judgment of the Sizes of the Distant Objects.

HARMAN, N. BISHOP, London. (Report of November meeting of the Ophthalmic Society of the United Kingdom, *The Lancet*, Dec, 5, 1903). Reference is made to a note in the *British Medical Journal* of Sept. 12, 1903, wherein a writer drew attention to an experiment in which, by an illusion, the experimenter was led to believe objects seen were smaller and more distant than they were known to be; this had been attributed to the influence of accommodation. Mr. Harman pointed out that these facts were true and well known. He showed by several simple experiments with prisms and stereoscopic views that objects could be made to appear either small or large at will, and that this illusion was due to the state of balance of the extra-ocular muscles. The unconscious cerebration led the observer to suppose that objects of a given size appeared, when seen under unnatural conditions of convergence, smaller and more distant, but when seen under unnatural divergence they seemed larger and nearer than they were known to be. Mr. Harman showed that in the progression of the vertebrates increase of visual acuity was coincident with the moving of the eyes from a primitive lateral position in the head to a forward position in which the visual axes could approximate a normal parallelism; the change was complete in man and with him special perception was probably most perfect. Coincident with these changes was a specialization of the superior oblique muscle. Mr. Harman pointed out that in the plaice almost the whole of this slow progression had been anticipated at a bound. This fish elected to live a life resting on one side, and it appeared to depend above all other fish on the acuity of its eyes, both of which were turned upward on the uppermost side and were, he thought, capable of some degree of parallelism of visual axes. In this fish he had found the same special features of the superior oblique muscles which characterized the higher vertebrates; they were not found in any

other than flat fish and not even in the embryo forms of these. He believed that the steady progression of the vertebrates towards binocular vision indicated the pre-eminent importance of extra-ocular muscle balance in the factors which went to form their judgment of size and space.

C. H. M.

The Treatment of Dacryocystitis by Extirpation of the Lacrimal Sac.

ROLLET, ETIENNE, Lyons, (*The Ophthalmoscope*, Dec. 1903). The author finds that probing and injections generally suffice to control simple dacryocystitis with ectasia, so-called lacrimal blennorrhagia. Operation may be required in old and rebellious cases, where the introduction of probes is painful or impossible, when the patient demands a speedy cure, or where a cataract may be extracted. In cases of lacrimal tumor, with mucous or purulent contents, ablation of the sac is the only rational procedure, as also in chronic lacrimal fistulae, tuberculosis dacryocystitis and purulent dacryocystitis.

In phlegmonous inflammation of the sac one should first open the perisaccular collection of pus and wait until edema has subsided. It is only late in the disease that one can extirpate the sac "a froid," as in appendicitis.

An incision about 15 mm. long is made, starting from the level of the internal palpebral ligament and descending at first perpendicularly and then outward, running parallel to the ascending process of the superior maxilla, which can be felt with the finger. The anterior wall of the sac is exposed, and the postero-internal portion of the periosteum and the external wall of the sac freed by a sharp elevator, not by a bistoury. The cupola of the sac is next disengaged and drawn forward, and the sac cut away from its attachments at the level of the nasal duct. The latter is then curetted, hemorrhage arrested by pressure forceps, oozing by tampons. No drains or sutures are used. Primary union takes place on the fourth or fifth day. Suppuration and the accompanying conjunctivitis are immediately cured. Neither ectropion, keloid, nor adherent cicatrix has been observed.

Of twenty-seven patients, 90 per cent. were definitely cured. In 67 per cent. there was no lacrimation; in 22 per cent. it was insignificant, and appeared only after exposure

to the elements; in 11 per cent. it persisted. The secretion was, however, non-irritant and non-infective, causing only slight inconvenience. This disappearance of lachrimation, which may immediately follow operation or be delayed for some time, is probably due to the removal of the irritating sac contents and, perhaps also, consecutive atrophy of the lachrimal gland. Experiments on animals lends support to the latter theory.

P. H. F.

The Eye Symptoms of Rheumatoid Arthritis, With Special Reference to the Field of Vision.

BEAUMONT, W. M., Bath, Eng. (Report of the Jan. Meeting of the Ophthalmic Society of the United Kingdom, Jan. 28, 1904, *The Lancet*, Feb. 6, 1904.) Whether the bacillary view of Dr. G. A. Bannatyne and Dr. Wohlman, or the cerebro-spinal toxæmia theory of Dr. Llewelyn Jones were accepted, much in the pathology of this disease is obscure. After alluding to the transient obscurations of vision, the ephemeral palsies of the external ocular muscles, and to the frequency of conjunctival, and even corneal anæsthesia in rheumatoid arthritis, Beaumont referred particularly to the decided contraction of the field of vision which often occurred in that disease. In a compound chart made up of the average field in 24 male patients suffering from rheumatoid arthritis, he showed the similarity of the field to that of 50 women suffering from the same disease. These average charts were arrived at by what he believed to be a novel method. The number of degrees from the fixation point outward was noted in each of the 24 male patients, added together and divided by 24, in order to get the mean. The other meridians were then treated in a similar way and so an average field of vision was constructed. That of the 50 female cases was constructed in the same manner. The uniformity in the fields of vision in male and female, he thought, quite excluded hysteria as a factor in the causation of the contraction. There was no central scotoma in rheumatoid arthritis, there was no evidence of optic nerve atrophy, and there was not usually more than a proportionate contraction of the color field. He remarked upon the Raynaud-like symptoms which sometimes occurred in rheumatoid arthritis, as pointed out by Dr. Llewelyn Jones, and he said that Dr. Samuel Lodge had observed contraction of the field of vision in connection

with Raynaud's phenomena. It might be that the small field of vision in rheumatoid arthritis was due to the synopal condition of the terminal vessels of the retina. Diagrams of the field of vision in rheumatoid arthritis were shown in which decided expansion occurred during the inhalation of nitrite of amyl, whereas in healthy persons no such expansion took place.

C. H. M.

**On Congenital "Defects of Motility" of the Ocular Muscles.
Report of Two Cases.**

BARCK, C., St. Louis. (*Am. Journ. Ophthalm.*, Dec '03). Whilst congenital ptosis and nystagmus are relatively frequent and have been studied for a long time, congenital affections of the extrinsic eye muscles have only lately received consideration, the first collection of such cases and sharp limitation of the clinical picture being the work of Carl Kunn (Deutschmann's *Beitraege zur Augenheilkunde*, 1895.) The writer gives extracts from various textbooks in which this subject is briefly considered. He narrates the histories of two cases which came under his observation:

The first case occurred in a boy six years old. "In the right eye, ptosis of medium degree. Eyeball cannot be moved upwards, and very moderately inwards. The movement downwards is somewhat better, accompanied by a rotatory motion (action of the superior oblique). When looking straight forward the axes appear parallel; sometimes there seems to be a very slight divergent strabismus. When looking to the left the strabismus increases. Double pictures cannot be elicited. Pupillary reaction and accommodation normal." In this case there was "a paretic condition of the levator and of the extrinsic muscles controlled by the motor oculi. The movement downwards was accomplished mainly by the superior oblique. The intrinsic muscles, sphincter iridis and ciliary muscles were intact. This feature invariably has been found in congenital motor deficiencies. The affection was unilateral."

The second case was observed in a girl ten years old: "There is a rotatory nystagmus in both eyes. The eyes can be moved to the right as well as to the left in a limited degree only. The motion upwards lags also behind, but is somewhat better. Downward it seems to be about normal. The convergence is intact. Patient can converge up to 10

cm. The pupillary movements and the accommodation are also normal. Double pictures can be elicited by any of the usual methods. In this case both eyes were affected, but the right eye slightly more than the left. The levators were free. Besides the nystagmus, not only the extrinsic muscles controlled by the third nerve, but also the external recti were affected. Here, again, the superior oblique muscles seemed to possess the strongest functional power. The pupillary movements and accommodation were likewise unaffected. Another characteristic feature in this case was the integrity of the movements of convergence which could be executed easily to the normal near point. The same internal recti, which showed insufficient action in the associated movements, functionated perfectly in the conjoined movements. Such a condition is remarkable and is also pathognomonic for congenital lesions, as it has never been found in acquired pareses.

The points for differential diagnosis between congenital defect and acquired nuclear paralyses are:

(1) In the congenital forms, frequently a palsy of the associated movements is found while the convergence remains intact. In the acquired this strange relationship is never met with. My second case is a typical illustration. A satisfactory explanation of this phenomenon is still wanting.

(2) In the latter, sooner or later, secondary contraction of the antagonist takes place, causing strabismus; in the former no contraction takes place, and we frequently find, therefore, parallelism of the axes in the primary position (when looking straightforward).

(3) Congenital defects are frequently one-sided, while infantile nuclear palsy affects both sides.

(4) The congenital are frequently accompanied by other defects of development, e. g. facial paresis, etc.

(5) In the acquired palsies there are double pictures; and if one picture is habitually suppressed, and therefore no double vision complained of, it can easily be elicited by our usual tests. In the congenital, the eyes never acted together, there was never binocular vision; therefore double pictures cannot be elicited. In the second case, where the patient was old enough to give intelligent answers we made long and careful tests, but with the usual negative results as to double vision.

The congenital form affects frequently some members of the same family; the acquired are isolated cases only."

The different forms of congenital defects of motility are given as follows: "Simple ptosis, uni—or bilateral; ptosis combined with a paresis of one or more branches of the motor oculi, i. e., those controlling the extrinsic muscles, the intrinsic ones remaining intact always; finally complete ophthalmoplegia exterior, where the external recti and superior oblique are also involved. Then, isolated paresis of the abducens, uni—or bilateral, is found; here ptosis is always absent. As to the relative frequency, uncomplicated ptosis and uncomplicated nystagmus rank first; then, affections of the abducens, and finally those of the motor oculi, with or without ptosis, up to complete ophthalmoplegia exterior."

The writer gives a number of data bearing upon the question of etiology. In a certain number of cases the defect is muscular; in a larger number the nervous apparatus is at fault. In those instances in which the associated movements are involved while convergence remains intact the lesion must be situated in the centers which govern co-ordinated movements. Whether in other cases, the lesion is a nuclear, subcortical or cortical one can only be conjectured; the relative frequency of acquired nuclear paralysis might speak in favor of the supposition that the nuclei are at fault in the majority of the congenital defects also, but we have no evidence to support such an assumption.

As to therapy, the best procedure is to avoid intervention since operations which have been performed in such conditions have not given satisfactory results. C. H. M.

Experiments to Determine the Value of Formalin in Infected Wounds of the Eye.

CLAIBORNE, J. H., and COBURN, EDWARD B. New York; (*The Medical News*, Nov. 21, 1903). The writers give details of these experiments, inspired by a recent report of the use of intravenous injection of formalin 1:5000 in a case of general streptococcus infection. They began by determining the effect of the injection of 10 minims of a 1:5000 solution of formalin into the normal vitreous of the rabbit, and found that this procedure produced temporary glaucomatous symptoms, but that on the following day no signs of the injections were visible. Then the symptoms of injection fol-

lowing an injection of streptococcus material into vitreous of the rabbits were noticed. Finally the effect of formalin injections into the vitreous of such infected eyes of rabbits were studied. The following conclusions were arrived at:

"1. Formalin, 1 in 500, may be injected into the vitreous of rabbits without producing more than momentary disturbance of the eye.

2. It is possible to cause panophthalmitis and consequent destruction of the eyes of rabbits by injecting three minims of a turbid solution of streptococci into the vitreous.

3. It is possible to produce the same result by infection in the ciliary region caused by penetrating wounds with infected pointed instruments.

4. Infections of the vitreous and ciliary region do not necessarily cause destruction of the eye. At times the infected eye recovers spontaneously, the inflammatory symptoms gradually subsiding.

5. Formalin, 1 in 1,000 when injected into the vitreous, exerts no influence on streptococcus infection of the vitreous.

6. The results of these experiments warrant the treatment of commencing infections of the eye by injections into the capsule of Tenon of 1 in 1,000 or even 1 in 500 formalin solution."

C. H. M.

On the Relationship of the Argyll-Robertson Phenomenon to Syphilis.

CLARKE, J. MITCHELL, Bristol, England. (*The British Medical Journal*, Dec. 26, 1903). The writer presents a study of the relation of the Argyll-Robertson phenomenon to past syphilitic infection based upon observation of 37 cases of cerebral and spinal syphilis. He considers the following conclusions legitimate:

"That a previous syphilitic affection is not sufficient without some further change to lead to the presence of the Argyll-Robertson phenomenon, and in 37 cases of cerebral and spinal syphilis, where the mischief was confined to the ordinary visceral lesions of that disease, that is, gummata, gummatous meningitis, syphilis endarteritis, the sign was not typically present. That in similar cases where it may be present, and in other cases with a history of past syphilis in which it occurs as an isolated sign of disease, it is evidence of

further degenerative process at work within the nervous system. That this degenerative process is to be regarded in the large majority of cases as a parasyphilitic eye, although in a certain proportion proof of this is wanting, and there is possibly some other cause at present obscure. That this degeneration may remain stationary at an early stage without further development for long periods. If these observations are correct, the Argyll-Robertson phenomenon is an even more important sign of the disease than it has been previously considered." C. H. M.

The Ocular Complications of Mumps.

WOODWARD, J. H., New York. (*New York Medical Journal*, Jan. 2, 1904). The writer prefaces the history of a case of optic neuritis due to mumps by a condensed resumé of the papers, one by Antonelli, the other by LeRoux, both published in the *Archives d'Ophthalmologie* for October, 1903, which are interesting and instructive in showing the wide range of effects produced by mumps upon the visual apparatus.

"Abscess of the eyelids was noted once by Strzemieski; and bilateral conjunctivitis, without suppuration, accompanied by edema of the eye lids and by lacrimation, was observed by the same author.

Inflammation of the cornea, sometimes in the ulcerative form, has been noted in rare instances.

Pechin observed one case of iritis in both eyes, complicated by keratitis in the right eye, nine weeks after an attack of mumps.

According to LeRoux, Harty was the first, in 1876, to direct attention to this subject. Le Roux subdivides his observations into three groups: (a) Cases of simple and slight dimness of vision; (b) cases of dimness of vision accompanied by hyperemia of the papilla; (c) cases of marked dimness of vision associated with intense hyperemia of the papilla; difficulty in distinguishing colors, and attacks of vertigo. In all, the symptoms were transient

Leriche and Strzemieski describes an inflammation of the lacrimal glands which may precede, or be coincident with, or may follow an attack of mumps.

Paralysis of the accommodation was observed by Baas. Paralysis of the accommodation and of the soft palate was noted in a child aged nine years by Mandonnet, who searched

for, but did not find, other evidences of diphtheria in his patient.

Amblyopia of both eyes, occurring fifteen days after the onset of mumps, was observed by Le Roux. Two weeks later, ophthalmoscopic examination revealed slightly enlarged retinal veins. The optic discs were somewhat hyperemic, but they were not edematous. The fields of vision presented central scotomata for red and green, as in toxic amblyopia, but they were normal in other respects. Improvement began in about three weeks, and in about six weeks, complete restoration of vision was noted and it continued permanently. Tobacco, alcohol, syphilis, and rheumatism were positively excluded."

"According to Antonelli, eighteen cases of optic neuritis, due to mumps have been reported. This optic neuritis is slow in developing, becoming manifest about one month after the attack of mumps.

Talon, in 1883, reported a case of unilateral optic neuritis, occurring one month after mumps, accompanied by headache, nausea, coryza, and convulsive attacks, which ended in atrophy of the optic nerve and blindness of the affected eye.

Blanchard published in 1899, the case of a soldier, 23 years of age, manifesting no traces of syphilis, alcoholism, nephritis or diabetes, who developed a neuroretinitis in both eyes one month after a severe attack of mumps, that terminated in white atrophy of both optic nerves, and was complicated by transient paralysis of the right internal rectus muscle.

Strzeminski published the observation of an optic neuritis of the left eye with absolute central scotoma which could be attributed only to an attack of mumps that occurred a few days prior to the onset of the ocular symptoms. Treatment by sweating, the administration of iodides, and hypodermic injections of strychnine was followed by a complete cure.

To these observations, I am able to append the following history of a case of optic neuritis due to mumps, which has been under observation now some eighteen months, and which presents certain features that are not reported as existing in any other similar case, the details of which have come to my notice."

The patient observed by Woodward was a girl of eleven, who had bilateral mumps in February, 1902. Several weeks later she complained of pain in the left eye. March 27th, an ophthalmologist reported: "General redness of the left eye, the cornea hazy, the pupil dilated, the intraocular tension raised (+ 2), and numerous large blotches in the fundus which looked like hemorrhages. It was much the picture of thrombosis of the central vein, but the cornea was so hazy that no details of the fundus were really seen. The lower part of the fundus gave a whitish reflex. Vision was perception of light; the upper part of the field of vision was blind. Anterior sclerotomy was performed. On April 3rd, the cornea was less hazy, the fundus was a little more distinct, and here and there a blood vessel was visible."

On April 5th, 1902, the writer observed the following: "I found the girl's right eye normal in every respect. The vision of her left eye was perception of light. The conjunctiva was congested, and the veins in the ciliary region were engorged. The left eye diverged a little and was a little more prominent than its fellow, but neither paralysis nor paresis of any extrinsic ocular muscle was discovered. The pupil was completely dilated and immovable. The retinal veins were large than normal and tortuous, and breaks in the dark line of the veins were distinctly seen. A number of apparently normal retinal arteries were visible, and a number of whitish streaks were found in the fundus that seemed to be empty arterial twigs. The greatest disturbance was in the region of the optic disc, which was so edematous as to be unrecognizable. No disease of the kidneys was discovered at any time in this case; and the anemic heart murmur which was present at the examination on April 5th, was not detected at any subsequent examination. There was no systemic taint of any sort."

On July 16th, 1903: "The pupil is dilated as before; the cornea is dull, but perfectly transparent. There is little fundus reflex, and it is not possible to distinguish detail in the interior of the eye. The loss of fundus reflex is probably due to several constitutional diseases that assailed her during the winter. The intraocular tension is plus $1\frac{1}{2}$."

C. H. M.

The One-Hand Method of Testing the Tension of the Eye.

AYRES, S. C., Cincinnati, O. (*Amer. Jour. of Ophthalm.*, Jan., 1904.) For a good many years the writer has been using the index and middle fingers of one hand in preference to the index fingers of the two hands, in testing normal and abnormal tension of the eyeball.

"I think that I have a more delicate sense of touch in one hand than I have in two. The method is as follows: The patient is directed to close the lids gently and look down. The two fingers are then placed on the eyelid and pushed up against the rim of the orbit, the finger nails resting against it. Then alternate pressure is made over the ball. A more delicate sense of variation from the normal tension can be detected in this way than by the ordinary method. I usually stand on the left side of the patient and use my left hand by preference, but can use either.

One of the advantages of this method is that in making the test the arm is free and at rest. It is particularly useful when examining a patient lying in bed. Here one has to lean over sometimes in a very uncomfortable position, and the arms are bent at right angles and elevated from the body. In making an examination under these circumstances, with two hands, and even while standing and when the patient is sitting, the index fingers are not parallel and point somewhat toward each other. In the one-hand method the fingers are close together and parallel to each other and in their normal position. In my judgment we derive a more delicate tactile sense from the two fingers which are next to each other than we do from the index fingers of the two hands placed side by side. More accurate ideas of the tension are more quickly acquired with much more comfort to the patient and to the surgeon by the one-hand method."

C. H. M.,

Ophthalmoscope for Demonstrating the Fundus.

FROST W. ADAMS, London. (*The Ophthalmoscope*, Jan., 1904), has modified the excellent instrument of Priestly Smith so as to enable "two observers to see the same image of the fundus simultaneously, and permits either of them with a pointer to indicate to the other any part of the image." The essential change is the addition of an equilateral prism, a little wider than the mirror aperture, which is placed with one face directly behind the mirror and at right

angles to the line of sight. The image from the fundus is reflected in two opposite directions by the sides of this prism, being reversed in its passage. The two images resulting are passed, each through another prism, and can be seen independently by two observers.

P. H. F.

New Dental Signs of Hereditary Syphilis.

DARIER, A., Paris (*The Ophthalmoscope*, Jan., 1904), lays stress on the diagnostic significance of Hutchinsonian teeth, which are accompanied, sooner or later, by interstitial keratitis, chorioiditis, and osseous lesions. In many instances where the incisors and the canines show no alterations or when the changes are poorly marked, he had often found analogous alterations as regards the first permanent molar teeth. As in the Hutchinsonian teeth, an arrest of development coming into play at the moment when the summit of the tooth covers itself with its cap of protective enamel, the four tubercles, insufficiently covered, exposes the yellowish dentine. The enamel forms below, thus enclosing as with a collar, the four tubercles, which are very fragile and are soon destroyed by caries or ground down in chewing. This dental feature may be present even in adults of a certain age.

P. H. F.

A Simple Method of Finding the Interaxial Distance for the Centering of Spectacle Lenses.

M'GILLIVRAY, ANGUS, Dundee, Scotland. (*The Ophthalmic Review*, Dec., 1903.) "In most of the textbooks on ophthalmology and refraction one is struck by the frequency with which the interpupillary distance is given as a guide to the centering of spectacle lenses. What one should aim at in all cases of orthophoria is to see that the spectacles are so adjusted that the visual axes traverse the optical centres of the lenses, and thus obviate prismatic effect. But the center of the pupil seldom coincides with the part traversed by the visual axis, especially in cases with high angle alpha, as in hypermetropia, consequently the interpupillary distance cannot be regarded as a reliable guide.

If a patient be asked to look, with both eyes widely open, at a lighted candle, held say at reading distance, a brilliant tiny reflection will be seen on each cornea. This reflection, as shown by Priestly Smith and Maddox, corresponds for all

practical purposes to the portion of the anterior surface of the cornea traversed by the visual axis. All one has to do then is to find an efficient and ready means of measuring the distance between these reflections, i. e., the interaxial distance, at a point in front of each eye corresponding to the position of the spectacle lenses.

For the past few years we have used a form of sliding rule by which accurate measurements of the interaxial distance can be obtained in a few seconds. The instrument consists of a mechanic's pocket steel rule (No. 412 D., Chesterman), round which is rolled a narrow strip of white paper with the running end gummed down, and so adjusted that it will slide along easily with the surgeon's finger.

To take the centres for reading glasses ask the patient to hold a lighted candle straight out in front of him and to look steadily at the flame. The surgeon then places the edge of the rule, marked in millimeters, over the bridge of the nose so that the flat surface next the eye may correspond to the posterior surface of the lenses. The square end is then placed exactly in front of the left corneal reflection and held there, then the piece of paper is made to slide along till its edge is opposite the right corneal reflection. The rule is now removed from the patient's face, and the measurement read off. The surgeon should be careful to make his observations from a point as close behind the candle as possible and preferably with one eye closed.

Instead of the candle flame we have tried, in conjunction with the sliding rule, the reflection from an ophthalmoscopic mirror as recommended by Priestly Smith for strabismometry, but have found it unsuitable for the obvious reason that the reflection from the corneae could not be seen simultaneously.

In estimating the centers for distance glasses an electric lamp, placed above the level of the observer's head (6 meters away) is preferable to the candle flame, as the reflection from the latter is too small to be seen easily.

Another use the sliding rule can be put to is to ascertain that the spectacles, before being sent to the patient, have been centered according to prescription. To do this place the rule flat on the spectacle lenses and after adjusting it so that the square end may correspond to the vertical line passing through the optic centre of one lense, fix it in position

with the finger and thumb of one hand. This vertical line can readily be found by looking through the lens at a vertical line, say the cord of a window blind, and moving the lens from side to side till the cord appears unbroken. Once the square end of the scale is found to coincide with the vertical line passing through the optic axis of the lens, look at the cord again through the other lens and slide the paper along till the edge of the paper and the whole cord are in line. The scale can now be removed and the correct measurement read off. The method of estimating the centers of spectacle lenses by measuring the distance between corresponding points of each rim is far from reliable, seeing that it assumes that the optic centers of the lenses and the centers of the spectacle rims are identical. This is not the case in the writer's experience, for he has found that opticians are not always careful in attending to this important point."

C. H. M.

Ocular Headaches and Other Ocular Reflexes, A Statistical Study.

ZIMMERMAN, M. W., Philadelphia. (*N. Y. Med. Jour.* Nov. 21, 1903.) The writer reports various details of a series of cases systematically noted. Of two thousand refraction cases 1,427 presented some form of headaches as a symptom. In about 71 per cent. purely frontal pain, and in 87 per cent. frontal combined with pain in other parts of the head, was found. The next most frequent location was temporal, after which came general, vertical, and occipital.

As to the kind of refractive error generally causing headache, compound hypermetropic astigmatism, of low or moderate degree is much the most common (49 per cent. and following this at a considerable distance, the lower grades of simple hypermetropia.

The time of onset or, when constant, the period of greatest intensity, varies very much, usually bearing a direct relation to the eye-work of the individual. While prolonged near work is an acknowledged factor, the theater, concert hall, public games in bright sunlight are common sources, as are travelling and reading in street cars.

Of 550 cases specially examined, about 20 per cent. showed noticeable muscular imbalance. Of divergent squint there were 11 cases with headache and 13 without; of convergent

squint 19 and 33 respectively. Of 2000 cases, 201 returned for re-examination, of which 107 reported headache. The shortest period of relief noted was six months, the average nearly three years, "which probably very nearly represents the length of time a correcting glass may be expected to give satisfactory results."

Among the 1,534 cases of headache 19 per cent. made specific mention of illness preceding the onset of ocular symptoms. Pregnancy and prolonged subsequent lactation are very frequently followed by a change in the optical error. Epidemic influenza, even when the acute period has been brief and seemingly mild, neurasthenia, general ill-health, typhoid fever are other predisposing factors.

Other reflexes such as vertigo, blepharospasm, epileptiform attacks, shoulder pain, and abnormal head position, were also noted in 17 cases, in which 9 were cured by glasses.

In a group of about 800 cases in which the results of treatment by correction of ametropia were recorded 86 per cent. of practical cures were obtained.

P. H. F.

BOOK NOTICES.

A Manual of Diseases of the Eye, for Students and General Practitioners.

VEASEY, CLARENCE A., A. M., M. D., 12 mo., 410 pages, with 194 engravings and 10 colored plates. Lea Bros. & Co., Philadelphia and New York. \$3.50.

The title of the book describes the intended use of this estimable little volume, as it does not undertake to discuss the many theories regarding unsettled ophthalmic questions, but gives the latest and best views held. An additional chapter on ocular conditions met with in general diseases would be a good thing for the general practitioner (Mention of some of the newer therapeutic agents in treatment has been omitted, such as dionin, cuprol, etc.).

The feature of using only the apothecaries' system in denoting the strength of preparations is a subject for criticism, as they should also be given in the metric system.

The greater portion of the book is devoted to organic diseases of the eye, which is proper for the use intended. The book is heartily recommended, as it covers all the subjects, is well printed and fully illustrated.

NELSON M. BLACK.

The Eye, Its Refraction and Diseases.

GIBBONS, EDWARD, M. D., Assistant Surgeon of the Presbyterian Eye, Ear and Throat Hospital; Demonstrator and Chief of Clinic of Eye and Ear Diseases in the University of Maryland, Baltimore. The refraction and functional testing of the eye, complete in itself, in twenty-eight chapters with numerous explanatory cuts and diagrams. New York and London, The McMillan Company. (Price in cloth \$5.00 in half morocco, \$6.50.)

This work of 472 pages is a welcome addition to the library of the practicing ophthalmologist, as it gives practical information of the kind and quantity needed for his actual work. The deductions of the various formulæ used in optics have been simplified and inserted. It is customary

to omit the mathematics of the subject from treatises of this kind, but the author feels that the student should be familiar with the physics involved for the proper understanding of the subject. The scope of the work precludes as frequent reference to authors as the writer would like. The author feels that the new material and diagrams the work contains justifies its publication, so offers no apology for adding one more to the numerous books upon the same subject.

From the nature of the subjects discussed therein there is little new that is not already in other text books.—If we wish for thorough elucidation of physiologic optics, we must yet refer to Helmholtz, Landolt and Tscherning. Myopia is treated almost entirely from the refractionist's standpoint, and not as it is, a diseased condition. For a work published in 1904 there are some omissions that should not have occurred. For instance, in discussing the theory of light, radio-activity and the theory of Ions might have been mentioned, as the author has gone rather deeply into the corpuscular and undulatory theories. Under the head of "Ophthalmoscopy" there is no mention of the electric ophthalmoscope or even of electricity, by the light of which certain minute changes in the fundus may more readily be observed than by the yellow gas light. In a personal letter to the reviewer the author states that "This is Volume 1 of the work. 'Volume 1' was omitted from the title page and cover at the instance of the publishers, until Volume 2 was ready. Squints and paralyses are dealt with fully in the second volume."

The book is on heavy paper, weighing $3\frac{1}{2}$ pounds, the pages being 7 x 9 inches. Such a shape certainly is not as esthetic as the ordinary $5\frac{3}{4}$ x 9 inches or 7 x 10 inches, both of which are conducive to better wearing qualities. The type space in a 7 x 10 inch page should only be $4\frac{1}{2}$ inches wide, the height $7\frac{1}{2}$ inches, whereas in Gibbon's book the width of the type is $4\frac{7}{8}$ inches (this width tires the eyes), the height is $6\frac{1}{2}$ inches. Publishers should not allow such defects in a scientific work. The author says, page 209, line 19, "The length of the line in the ordinary newspaper column is about the length that fatigues the eyes the least."

For a work containing so many formulae the proof read-

ing has been well done. Type and paper are good. The last chapter on "Spectacle, Nose-Glass Fitting, Measuring Lenses," etc., is of much practical interest. Index is complete.

H. V. WÜRDEMANN.

Saunders' American Year-Book for Nineteen Hundred and Four.

The American Year-Book of Medicine and Surgery for 1904. A Yearly Digest of Scientific Progress and Authoritative Opinion in all branches of Medicine and Surgery, drawn from journals, monographs and text-books of the leading American and foreign authors and investigators. Arranged, with critical editorial comments, by eminent American specialists, under the editorial charge of George M. Gould, A. M., M. D. In two volumes. Volume I, including General Medicine. Octavo, 673 pages, fully illustrated; Volume II, General Surgery. Octavo, 680 pages, fully illustrated. Philadelphia, New York, London: W.B. Saunders & Co., 1904. Per volume: Cloth, \$3.00 net; Half Morocco, \$3.75 net.

The American Year-Book of Medicine and Surgery continues to maintain its high place among works of its class. Such a distinguished corps of collaborators, which the editor, Dr. George M. Gould, has enlisted as his assistants is sufficient guarantee that the essential points of progress are brought out, and the collaborators' notes and commentations are excellent. In the illustrative feature the 1904 issue fully maintains its reputation, there being fourteen full-page insert plates, besides a number of excellent text cuts.

Vol. II, General Surgery, fitly describes the progress of the surgical branches of medicine during 1903, 110 pages are given to Ophthalmology, Otology, Rhinology and Laryngology; 50. pages of which are allotted to Ophthalmology under the editorship of Walter L. Pyle and Samuel Horton Brown, of Philadelphia. Nearly all of the articles and books mentioned have been reviewed in these ANNALS, and we are most pleased to notice that most of our original articles are noted in this most excellent Year-Book as having contributed to the progress of ophthalmology.

H. V. WÜRDEMANN.

Transactions of the Ophthalmological Division of the American Academy of Ophthalmology and Oto-Laryngology.

Eighth Annual Session held at Indianapolis, Ind., April 10, 11, 12, 1903. (Published by the American Journal of Ophthalmology, St. Louis, Mo.)

The above volume contains 183 pages devoted to ophthalmology, comprising nineteen papers, together with discussions, presented at the Indianapolis meeting of the American Academy of Ophthalmology and Oto-Laryngology. (formerly the Western Ophthalmic and Oto-Laryngologic Association).

The essays are of a high standard of excellence, many of them containing original and valuable ideas in ophthalmic surgery and therapeutics.

J. Elliot Colburn presents the subject of "Clinical Experiences in the Treatment of Phorias and Tropias," detailing the clinical histories of a number of cases, and showing the results to be gained by a persistent and thorough study of this class of cases.

F. C. Hotz in his paper on "Three Essential Points in the Operation for Cicatricial Ectropion," draws attention to the following points:

1. The proper division and fixation of the skin flaps.
2. The selection of the most suitable material for covering the lids.
3. The shortening of the over-stretched lid border.

The operation on both upper and lower lids is given in detail.

"Episcleritis and Scleritis" is discussed by Adolph Alt.

Casey A. Wood presents in his essay on "Exsection of the So-called Tarsal Cartilage in Cases of Chronic Trachoma," the indications for the operation and its effects, and describes in detail the technique of his operation. The article is well illustrated by numerous diagrams.

The subject of "Paralysis and Paresis of the Muscle of Accommodation" is well handled by Geo. F. Suker, and "Blepharitis Marginalis," by Dudley S. Reynolds. Geo. F. Fiske, in his paper on "Glaucoma," draws deductions from a series of thirty-six tabulated cases. "How to Avoid Secondary Operations After Cataract Extraction" is the title of a paper by C. Barck, in which he presents a method of incising the capsule as follows: The first incision, of a crescentic shape,

begins laterally from the lower end of the vertical meridian; the second begins just as far mesially from this and intersects the first above the center of the capsule. He found in his last fifty cases that it was necessary to do a secondary operation in 10 per cent.

Among the other essays are "Electro-Cautery Treatment of Corneal Wounds and Ulcers," by J. A. Donovan; "Tuberculosis of the Iris," with presentation of microscopic specimens, by Wm. H. Wilder. "Mydriatics in Refraction of Presbyopes," by O. A. Griffin; "Keratoconus, Aetiology and Importance of Early Diagnosis and Treatment," by J. A. L. Bradfield; "Optic Neuritis (bilateral) Complicating Whooping Cough," by Wm. E. Gamble. "Neurasthenic Asthenopia," by L. J. Goux; "Degenerate Ocular Changes Resulting from Consanguinity," by Lee Wallace Dean; "Sarcoma of the Choroid," by W. Stanley Sampson; some remarks on the "Influence of Environment on the Eye," by Hamilton Stillson; "Rare Ocular Lesions in Scarlatina," by Ellet O. Sisson; "Some Rare Ophthalmic Cases," by Jas. Moores Ball, in which he describes a case of "Congenital Anophthalmos;" a case of "Discoloration of the Cornea with Blood Pigment," and a case of "Melano-Sarcoma of the Lower Eyelid."

The following officers were elected by the Academy for 1904: President, Edw. Jackson, Denver; 1st Vice President, Dudley S. Reynolds, Louisville; 2nd Vice President, J. J. Kyle, Indianapolis; 3rd Vice President, J. W. Murphy, Cincinnati; Secretary, D. T. Vail, Cincinnati; Treasurer, O. J. Stein, Chicago. The next annual meeting will be held in Denver, August 24, 25, 26, 1904.

WM. R. MURRAY.

Relation of General and Organic Diseases to Changes and Affections of the Visual Organ.

GROENOUW, DR. PROF. A., Breslau. Handbuch der gesunden Augenheilkunde; 2nd, entirely new edition, with illustrations, No. 67. Leipzig, 1903, W. Engelmann. Subscription price, 2 M.

This number brings the ocular affections in infectious diseases of which malaria, influenza, diphtheria, and epra cover the most space. It is characterized by the same completeness

as the previous numbers, with bibliography up to date.

C. ZIMMERMANN.

Methods of Examination.

LANDOLT, DR. E., Paris. Graefe-Salmisch, Handbuch der gesamten Augenheilkunde, 2nd, entirely new, edition. Nos. 63 to 66 with 59 illustrations, Leipzig, 1903, W. Engelmann. Subscription price 8 M.

On pages 305 to 327 L. concludes the chapter on accommodation. L.'s ophthalmodynamometer is illustrated, and described, which is very practical in determining the relation between accommodation and convergence. Photometry and photoptometry by Dr. E. Hummelshein, Bonn, from page 327 to 390 and chromatopsimetry by Dr. A. Krückner, Würzburg, from page 390 to 448 are very exhaustively treated. Chapter VII deals with the determination of visual acuity by Landolt, discussing the clinical methods, the optotypes, testing near vision, and from page 503 to 584 with the examinations of the functions of the excentric retinal portions, with numerous illustrations. Chapter IX on simulation of defective vision and of blindness by Dr. K. Wick will be continued. What we said in our review of the preceeding Nos. of L.'s book we can only repeat. It is a most thorough, up to date guide in this important field of ophthalmology.

C. ZIMMERMANN.

On the Formation of Papilloma on the Conjunctiva.

VELHAGEN, CHEMNITZ. Collection of ophthalmological essays by Vossius. Vol. V. No 7. Halle a.S., Carl Marhold, 1904. M. 0.80.

V. reports 2 cases of his own observation, with a review of the literature on papilloma of the conjunctiva, of which about 95 cases are published. Elschnig distinguished 3 kinds of polypoid tumors of the conjunctiva: soft, hard and papillomatous fibromata, to which the adenomata, springing from the glands of the lids, may be added. The papilloma is not only an excessive formation of the normal papillae, but may, according to Virchow, also occur on places of the conjunctiva, devoid of papillae. They are benign, but may become dangerous, when encroaching upon the cornea, or by transition, into progressive carcinoma. The treatment con-

sists in extirpation but relapses are frequent. The essay gives a good representation of this not very frequent affection.

C. ZIMMERMANN.

Operations on the Eye.

CZERMAK, Dr. WILHELM, Professor of Ophthalmology at the German University of Prag, *Die augenärztlichen Operationen*. Nos. 13, 14, 15. Wien, 1904, Karl Gerold's Sohn, I. Barbaragasse 2. M. 6.

After a suspension of six years we take great pleasure in announcing the continuation of this fundamental work which will be completed at the commencement of this year. Pages 813 to 821 conclude the chapter on removal of foreign bodies from the anterior chamber and the iris. The operations on the lens, with an historical introduction on reclination, extraction and discission, occupy pages 822 to 1004 and will be continued. On pages 854 to 888 discission is very exhaustively discussed. C. uses a small electric clamp for illumination, and Knapp's knife needle as instrument. Even if no increase of intraocular tension sets in after discission, C. advocates the extraction of the lens matter, but waits until all of it is thoroughly soaked. He rejects, however, discission as a preliminary operation for senile cataract. C. performs discission of secondary cataract in uncompleted cases on the 12th or 14th day. Accidents, after treatment, indications, contraindications, variations, combination with iridectomy, performance of discission with the pince-ciseaux of d. Wecker, receive minute and careful consideration.

In the chapter on extraction first the preparations are set forth, then the simple linear extraction, extraction without and with iridectomy, according to the same plan with regard to subdivisions, as mentioned under discission. The accidents during operation and disturbances of healing are given especial attention. Then follow after-diseases after cataract extractions, as inflammations, occurring after healing of the wound, detachment of the retina, glaucoma and a more detailed discussion of the single acts of the operation, as dealing with the lids, fixation of the eyeball, performance of the section, iridectomy: a. general remarks, b. mode of execution, c. time when to do it, d. procedures to prevent prolapse

of iris in simple extraction, sutures of the wound, peripheral iridotomy and iridectomy, opening of the capsule.

The literature is extensively utilized and the subject presented in a most objective, complete and attractive manner. The whole work is an excellent book which will enrich the reader with most useful and practical advice with regard to operative technique and clinical information. It ought to be in the hands of every ophthalmologist.

C. ZIMMERMANN.

Paradoxical Movements of the Lids.

LINDENMEYER, DR., A. M., Frankfort, *ibidem*, 1904. M. 1.20 \$0.30.

Paradoxical movements of the lids, i e., such as, even under pathological conditions, are not to be expected and contradict the generally accepted rules, have been observed in great number and various fashions. L. gives a review, with report of 2 cases, under the following captions: Concomitant movements of the lids in contractions of the submaxillary, pharyngeal and facial muscles, paradoxical associated movements of the lids and ocular muscles, spontaneous lifting of the upper lid, and advances hypotheses for their explanation, which will be read with interest.

C. ZIMMERMANN.

Jequirity, Jequiritol and Jequiritol Serum.

HOOR, K., PROF., Kolozsvár. *Sammlung zwangloser Abhandlungen an dem Gebiete der Augenheilkunde von Vossius*. Vol. V. Nos. 3 and 4. Halle a/S. Carl Marhold, 1903. M. 1.80 \$0.45.

H. reports the clinical histories of 121 cases, treated with Jequiritol, with an exhaustive essay on the subject and the following resumé: Jequiritol is unconditionally indicated in old trachomatous pannus with cicatrized and degenerated conjunctiva also in lymphatic pannus, maculae and cicatrices of the cornea, if, after subsidence of all inflammatory symptoms, they do not yield to the usual treatment. It does not at all influence affections of the conjunctiva, viz.: granulations, follicles, papillae. It must however be rejected in all purulent processes of the cornea as infiltrations, ulcers, abscesses, lymphatic efflorescences, and in recent opacities or recent trachomatous or lymphatic pannus. It allows of exact dosage, but the individual and temporary susceptibili-

ties of the conjunctiva for its use vary. It is not absolutely devoid of danger, as it may cause purulent infiltrations and ulcers of the cornea. The Jequiritol-Serum relieves the subjective discomfort during a Jequiritol-ophthalmia but does not remove the objective symptoms. C. ZIMMERMANN.

Syphiloma of the Ciliary Body.

VON EWETZKY, TH., PROF., Director of the University Eye Clinic at Jurjew. An anatomo-clinical study with four illustrations. 110 pages. Berlin, 1904. S. Karger. M. 3.30. \$0.85.

In this monograph the author gives a very complete clinical and anatomical picture of syphiloma of the ciliary body. The clinical histories of four cases, partly of his own observations, with the histological description of an enucleated eyeball are reported in detail. All 67 cases, so far published, are with their most important clinical details collected in tabular form. In the clinical part the symptomatology, changes in other parts of the eye, commencement, course and determination of the disease, differential diagnosis, treatment and etiology are very exhaustively treated. Then the anatomical conditions of syphiloma and the changes of the other parts of the eye are discussed; followed by a bibliography with critical remarks.

In 69 eyes the syphiloma of the ciliary body invaded the sclerotic 64 times, the anterior chamber 29 times, the vitreous body only four times. Not more than two syphilomata were observed in a single eye. It may grow from the size of a pea to that of a small nut, varying in color from yellow, red, violet, to grey and black, and the whole process may last from a few days to several weeks. It generally commences under violent inflammatory symptoms, presenting the aspect of severe iridocyclitis, and occurs most frequently in the third decade of life. Out of 66 eyes 42 grew blind (63.6 per cent.), 9 had V. less than 0.1 (13.68 per cent.), 8 (12.1 per cent.) V. from 0.1 to 0.3 and 7 (10.6 per cent.) V. 0.7 to 1. The prognosis is very dubious, 28 per cent. led to atrophy of the globe; in 30 per cent. enucleation had to be resorted to, to relieve the pain. Only in 2 cases out of 67 it was due to hereditary syphilis, in all others to acquired syphilis. In 43 per cent. of all cases it developed in the

first few months after infection, in 22.4 per cent. in the second half year, 8 per cent. in the third half year. In a few cases it occurred later. In more than 50 per cent. it was accompanied by secondary symptoms. The syphiloma of the ciliary body, therefore, belongs to the early manifestations of constitutional syphilis and occurs before the gummous period, so that it must be classified under the papules. The rapid destruction of sight is due to secondary complications in chorioid, vitreous and retina, of which detachment of the retina is the most frequent. It was found in 16 out of 21 eyes which were examined anatomically. The differential diagnosis from syphilitic iridocyclitis of the iris, the sclera or other tumors of the sclera, tumors of the ciliary body, especially sarcoma and tubercular nodules, is carefully considered. We heartily recommend this valuable and instructive monograph.

C. ZIMMERMANN.

Diseases of the Eye.

L. WEBSTER FOX, A.M., M.D., Professor of Ophthalmology in the Medico-Chirurgical College, of Philadelphia, Pa., Ophthalmic Surgeon in the Medico-Chirurgical Hospital with five colored plates and 296 illustrations in the text, New York and London, D. Appleton & Company. 1904.

The author states that this treatise is the outgrowth of a series of lectures delivered at the Medico-Chirurgical College and Hospital during the last ten years. The very large medical and surgical experience there obtained by him is by no means proportionate to the decade of which he writes.

Nearly every page of the most interesting text reveals the personality of the author, but in a manner which is open to but little criticism. Knowing Fox, as we do, we expect a certain positiveness and virility in his writings. The book is, as he says, "a digested summary of the known facts for use of students who in after-life become practitioners of medicine." Perhaps the reader may say to himself: "another book from Philadelphia!" That town does seem to breed the itch of authorship—but the work of Philadelphia ophthalmologists is nearly always good, and their published works are generally very welcome to the profession.—Such is the treatise of Fox. I am sure it will meet with favor on account of its completeness and the well known personality of the author. It being the province of the reviewer to point out

what seems to him to be defects, at the risk of being deemed hypercritical, I must object to the misuse of the metric system in the formulary; for in common with those who do not think or use the metric system in prescription writing he is too particular in his transposition of the apothecaries' system into metric terms; for instance, on page 552 he translates gr x of boric acid into .648 gm., cocaine gr. ss to .0324 gm. .65 and .03 sufficiently accurate and far less of a mathematical proposition. The advantage of the metric system lies in the per cent., and a person must think metrically in order to appreciate its simplicity. The apothecaries' system is used for weight in the body of the book, while measure is usually given in metric terms. If the author wishes to placate our English friends by spelling "tumour" and "colour" we may forgive the slight to American customs, but why leave the *h* out of "lachrymal" if Brittisms are to be preferred?

The publishers have not been fortunate in the selection of paper, it is too glossy and yellow and a wider margin to the page would be more esthetic. Many of the illustrations are imperfectly printed and the book is not a good example of either the bookmaker's or binder's art.

The arrangement of the treatise differs materially from most text books on ophthalmology as diseases are considered according to the structures attacked in the order from without inward.

Of special interest are the chapters on albuminuric and hemorrhagic retinitis, a brief though sufficiently exhaustive consideration of retinitis albuminosuria is interesting especially as this is the first text book on the eye to notice this condition. The chapter on retinitis is particularly well written, lid operations, cataract, glaucoma and diseases of the orbit. The most modern methods of treatment and diagnosis, such as the Roëntgen Ray, subconjunctival salt injections, etc., are fitly described. The author includes in each subject the treatment and form of operation he personally prefers, many of which are original with him.

The book is a most excellent and trustworthy guide to the diagnosis and treatment of diseases of the eye and as such is most heartily commended.

H. V. WÜRDEMANN.



"THE CHEVALIER" JOHN TAYLOR (1708-1767).

Reproduced from a Copper-plate Engraving in the Possession of
Dr. James Moores Ball.

(See article by Dr. M. Marquez, page 548.)

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No. 3.

AN IMPROVED SCALE FOR DETERMINING MUSCULAR INSUFFICIENCIES.

By HAROLD BAILEY, M. D

WATERLOO, IOWA.

The time and inconvenience attendant upon the measurement of both manifest and latent muscular defects, were the chief factors which prompted me in endeavoring to produce a scale which would prove at once an accurate as well as a rapid method for determining the insufficiencies of the ocular muscles. I have endeavored at the same time to make it convenient of adjustment as well as ornamental.

The scale consists, in substance, of four arms, two horizontal and two vertical, radiating from a common center in which is an aperture, the size of which is controlled at the will of the operator by an iris diaphragm with a scale at the margin marked off in 5, 10, 15, 20, and 25 mm. Behind the iris diaphragm and concealed from view is an electric light globe provided with a drop cord (see photograph E) for attachment to an electric light socket. The light is provided with a black asbestos chimney with an aperture corresponding to the opening in the scale. The background of the entire scale is black. The width of each arm is 10 cm. The length of each horizontal arm is 90 cm.; of each vertical arm 60 cm. The scale is marked off for use at a distance of six metres and for a distance of one metre. At six metres distance the large figures are used, being arranged

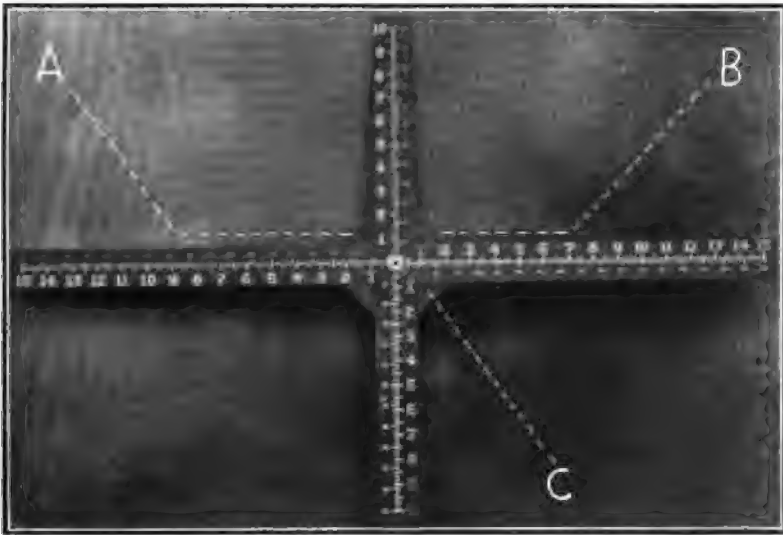
at intervals of 6 cm. The scale for use at one metre distance is marked off in cm. The large figures on the left arm are in white and numbered below the line; on the right arm in red and numbered above the line. The large figures on the upper arm are in white and to the left of the line; on the lower arm in red and to the right of the line. The small figures on the left arm are in red and numbered above the line; on the right arm in white and below the line. Those on the upper arm are in red and to the right of the line; on the lower arm in white and to the left of the line. For use at one metre is constructed a small brass rod (see photograph A-B) one metre in length, one end of which fits in socket (see photograph C) to the right and above the iris diaphragm, while to the other end is attached a plate to rest against the patient's forehead. The apparatus is fastened to the wall of the consultation room by means of screws. Such is a brief description of the scale as now constructed. For those who do not have the required distance of six metres a slight alteration in the measurement of the large scale could easily be made to conform to any distance desired.

I have found this scale to have a wide range of usefulness both in the subjective and objective measurements of muscular insufficiencies.

With the patient sitting at a distance of six metres with a Maddox rod in front of one eye, that figure on the large scale which is nearest to the point at which the line of light crosses the scale indicates at once the number of prism dioptres of insufficiency existing, and at the same time gives to the surgeon an idea of the strength of prism to be inserted in front of the other eye to produce approximate muscle balance. The figures being marked in red and white on opposite arms of the scale enable the patient to describe with greater conciseness, the exact position of the line of light.

In cases where the insufficiency is manifest and an actual squint exists, its degree can be quickly and accurately measured by means of the smaller figures. The patient is seated with eyes exactly opposite the central opening in the scale. The metre rod (see photograph A-B) is inserted into socket C, the plate A, at the opposite end of the rod, resting against the patient's forehead. The smallest size aperture is used in order to show the corneal reflection with greater

distinctness. The surgeon sits between the patient and scale with his head below the line of the patient's sight. As the patient fixes the light, the corneal reflection shows at once which is the squinting eye and gives an approximate idea as to the degree. For example—if the squint is approximately one of 25 degrees, the patient is directed to fix the sight on number 25 which will throw the reflection near to the center of the cornea. If not quite central, have him



fix the adjacent numbers in order until reflexion is exactly in the center of the cornea, when the number at which he is looking will be the exact measurement of his squint recorded in prism dioptries (allowance having been made for the angle gamma.) Any squint existing in the vertical meridian can be calculated in the same manner by using the vertical arms of the scale.

Whether the squint is concomitant or not is determined by the patient turning his head first to one side and then to the other, fixing the light the while.

In a similar manner in cases of ocular palsies the scale can be used in place of the old candle method, for determin-

ing which is the paralyzed muscle. The patient's head is turned in different directions to bring into use the different muscles instead of moving the candle up, down, in and out as in the old method. A red glass is placed over one eye, a green glass over the other, the position and relation of the two lights in the different fields of fixation show the directions of greatest and least diplopia.

The secondary deviation of a squint may be measured by covering the good eye and causing the patient to fix with the squinting eye that figure which will cause the light reflection to fall on the center of the cornea of the good eye when that eye is quickly uncovered.

The angle gamma may be determined by requesting the patient to fix that number which will bring the reflex directly in the center of the cornea.

I have not, as yet, had occasion to use this scale for testing eccentric fixation but it can be readily utilized for this purpose. By finding first the angle gamma of the good eye, then the angle gamma of the squinting eye, and by subtracting the one from the other we have the amount of eccentric fixation measured in prism dioptres and the position of the false macula thereby determined.

This description covers, pretty thoroughly, I believe, the field of usefulness of the scale. I consider it an improvement over the old forms of tangent scale in that the measurements are graded for a distance of six metres and are recorded in prism dioptres. The scale is provided with vertical as well as horizontal arms; the use of the one metre rod is superior to the string in that the position of the patient's head remains more stationary; the iris diaphragm and electric light make it easier to operate, and the corneal reflection is more distinct.

I take this occasion to thank Messrs. F. A. Hardy & Co., for their assistance in the construction of the apparatus.

A CASE OF BILATERAL ENLARGEMENT OF THE LACRIMAL GLANDS.*

BY WILLIAM T. SHOEMAKER, M. D.

PHILADELPHIA.

The case here presented was referred to me at the German Hospital, January 15, 1904, by Dr. Thompson S. Westcott. It is one of bilateral enlargement of the lacrimal glands, the accessory glands being possibly alone affected. The condition has remained stationary for four or five years, is without pain and gives annoyance only on account of the disfigurement and the pronounced ptosis on the right side.

The patient, G. W. is a colored girl nineteen years old, unmarried, occupation housework. Five years ago the upper lids became simultaneously swollen. For a very brief period, this was noticed only in the morning, and she thinks was more or less painful. The condition soon became as at present. The outer two-thirds of each upper lid at its base is swollen and pushed forward, forming a rather soft pendulous mass. There is almost complete ptosis on right side, the palpebral fissure being reduced to about 4mm. The left fissure is very little narrowed. The skin of the lids is soft and freely movable; the accessory glands can be felt in their proper positions along the upper fornix, and rolled around under the finger. They are quite firm and not at all sensitive to touch. The whole fornix can be everted and brought to view and seems to consist of over-grown glandular tissue covered with conjunctiva, dusky grey and not far from normal for this situation. All the outlying lobules of the accessory glands are involved. I cannot satisfy myself that the superior glands can be felt with the finger pushed into the orbit, although the orbit is quite large and roomy, but as will be noted below this does not necessarily exclude them. The conjunctiva of the tarsus and of the lower fornix is clear and pale. The eyeballs present no abnormality ex-

*Read before the Ophthalmological Section of the Philadelphia College of Physicians, February 16th, 1904.

ternally or ophthalmoscopically. Their movements are free and full in all directions. There is no evidence or history of previous ocular inflammation. V. O. D. is 5-12, V. O. S. 5-5. There is apparently no change in the lacrimal function, and crying does not alter the size of the swelling. The parotid and other salivary glands are not enlarged.



Bilateral Enlargement of the Lacrimal Glands (4 Years' Standing).

Her previous history is good. She menstruates normally, has never had rheumatism nor malaria. She had mumps on both sides two years ago; there is no evidence of syphilis.

Dr. Foulkrod made the physical examination for me. He found no enlargement of the spleen, or of any of the lymphatic glands. The blood analysis shows a rather profound simple anemia. The red cells are reduced to 2,640,000; the

leucocytes are 6500, the hemoglobin is 67 per cent.; the differential count shows a very slight lymphocytosis. The plasmodium was not found.

The urine has Sp. Gr. 1023, and contains a faint trace of albumen, and epithelial cells; no sugar.

Affections of the lacrimal glands constitute but a relatively small proportion of eye diseases, these organs enjoying as they do considerable immunity. Like other paired organs however they are liable from causes of certain kinds to be symmetrically affected. These bilateral conditions are comparatively rare. Maklakow¹, found that variety of bilateral enlargement of the lacrimal glands recorded as adenitis, acute and chronic, in literature but twenty times. (1901)

Hirschberg² in a brief summary of lacrimal gland inflammations wrote in 1890,

a.—Chronic inflammation of the lacrimal gland is not so very rare; it generally follows long standing corneal inflammation with lachrimation.

b.—Acute inflammation of the lacrimal gland is very rare.

c.—Sub-acute, non-suppurative bilateral inflammation is very rare.

This latter condition Hirschberg named mumps of the lacrimal glands in 1879. Gordon Norrie³ in 1890 reported in correspondence a case of genuine mumps starting in the lacrimal glands, and developing the following day in the parotids.

The first case of symmetrical enlargement of the lacrimal glands which I have been able to find in literature was cited by Makenzie⁴ in 1840. Both glands in a girl eight years old were converted into hard nodular tumors two and one-half inches long. Autopsy proved this case to be one of malignant neoplasm with secondary growths in the dura mater. From then on cases of bilateral enlargement of various character and cause were reported from time to time, but remained mostly as isolated cases until 1892, when Mikulicz⁵ segregating cases of symmetrical enlargement of the lacrimal together with the salivary glands, made a special study of them as a contribution to the Billroth Festschrift, and established a disease which has as yet no better name than that descriptive of the condition, although several names have been suggested. Mikulicz's study was based on his own case which was presented in 1888, a case reported by Halten-

hoff⁶ in 1899, and one reported by Fuchs⁷ in 1890, Following this came from his clinic the work of Tietze⁸ in 1896, and that of Kümme⁹ in 1897 with additional cases and findings. Since then cases have been reported by Haeckel¹⁰, Osler¹¹, and others.

This disease of symmetrical enlargement of the lacrimal and salivary glands, is characterized in its typical form by a slow forming, long standing enlargement of these glands without inflammation, without pain, and without demonstrable involvement of the general organism. The process remains limited to the gland, never passes beyond its boundaries, and consists of a lymph cell infiltration of the interstitial tissue. The lacrimal glands are not the most constantly involved, but are the first involved, and according to Tietze they are the most intensely affected. The glands affected however are those of the head of the salivary type and these may constitute any single pair or any combination of pairs. It is worthy of note that Mikulicz originally regarded the lacrimal glands as the starting point, and believed that they alone might be involved, and that the few cases reported of symmetrical non-inflammatory, non-painful enlargement of the lacrimal glands belong to this disease. He considers the disease infectious, as he says, in the broadest sense of the word. The infection may be from within, i. e., blood borne, or from without, i. e., by way of the gland ducts from the oral cavity or conjunctival sac. Complete removal of the gland is not followed by return, but partial removal is.

Such is briefly the character of a disease now recognized as one *sui generis*, and it is probable that a fair proportion of the cases of bilateral enlargement of the lacrimal glands will find their way under this classification.

In a second class can be placed those cases which are manifestly secondary to disease of the conjunctiva, the cornea, the sclera, or the iris. Emil Bock¹² has collected twenty-one cases of enlargement of the lacrimal glands of his own. Ten of these were double, and of these ten, four accompanied scrofulous conjunctivitis, one scrofulous keratitis, and one trachoma. E. Miller¹³ has had one case of double dacryoadenitis with double iritis (1903). The infection in all these cases and others similar was probably ectogenous.

A third class of cases is found in those occurring in the

course of some systemic disease. These likewise are secondary, but the infection is hematogenous. Thus symmetrical enlargement of the lacrimal glands has been recorded in the course of syphilis, secondary and tertiary, tuberculosis, leukemia (Gallasch¹⁴), pseudo-leukemia, mumps and measles. Tuberculosis of the lacrimal gland is on record but twelve times up to 1901 (Stieren¹⁵). Regarding mumps is an interesting case reported by Roger¹⁶, complicated by orchitis and enlargement of the lacrimal glands. The latter is not such an unusual metastasis. The case differs however from that of Gordon Norrie which developed first dacryo-adenitis, then parotitis, whilst the sequence in Rogers' case was parotitis, orchitis and dacryo-adenitis.

As diseases which have been complicated with dacryo-tumor (swelling) unilateral, with of course no reason other than chance that both glands were not affected, are found influenza, rheumatism, diphtheria, gonorrhoea, erysipelas, small-pox and cold. Strange to say malaria with its protean manifestations has not been held accountable for any of the cases which I have been able to find, although the spleen was noted as enlarged in several. Malaria comes pretty close to the lacrimal gland, and a more careful examination would probably establish a closer connection between the two.

True tumors attack the lacrimal gland and have a number of times been symmetrical. Those at least of a malignant type distinguish themselves from all other enlargements by their invasion, and their inherently destructive nature. They constitute a fourth class.

Finally are the cases unlike any of those just enumerated. Some of them might be called functional, for instance, a case of sudden, simultaneous enlargement of the lacrimal glands in an elderly gentleman apparently from grief and bereavement reported by McHardy¹⁷. Also a periodic painful enlargement of first one gland, then of the other at the commencement of menstruation, reported by Lagrange¹⁸. Likewise, those cases of enlargement without apparent cause which had disappeared in a short time with or without treatment, and perhaps also simple hypertrophy, a case of which was reported by Lambert¹⁹ with confirmatory microscopic examination belong here.

The symptoms of enlargement of the lacrimal gland are of

course in keeping with the character of the disease. Ptosis is rather constant, but the drooping of the outer two-thirds of the lid, leaving a little triangular chink to the nasal side, through which the patient looks, is very characteristic. Displacement of the eyeball forward, or downward and inward does occur but not so frequently as might be supposed from the text-book descriptions of dacryo-adenitis.

Emil Bock²⁰ has examined the lacrimal glands in a great many cases of health and disease, and also in the cadaver. He found much variation in different individuals, and in the same individual. He also found no definite relation as to size between the superior and the inferior or accessory glands. Whether or not an enlarged lacrimal gland can be palpated depends upon the direction in which it has enlarged, as well as the size of the space in which it has to enlarge. Restriction of ocular movement; and translation of the eyeball are likewise dependent. The ptosis is due to a pushing forward of the base of the lid, and to the pressure on the tendinous expansion of the levator muscle which passes as an aponeurosis between the superior and accessory glands. Disordered secretion is especially noted in some of the cases of Mikulicz's disease; such are dryness of the mouth, nose, and conjunctival sac.

The drugs which seem to have exerted the greatest influence upon the chronic non-inflammatory glands are arsenic and potassium iodid. Surgical removal under this heading has been attempted freely and unhesitatingly, and general y has effected permanent cure when complete.

The case which is here reported I am inclined to classify with those occurring in the course of systemic disease. Favoring this is the profound anemia, which actually exists and probably has existed for a long time, and also the possibility of syphilis, of which there is no evidence, but which always lends itself gracefully to the solution of questionable cases.

The cause of the ptosis in this case is not quite clear. The glandular disturbance seems to be about equally marked on each side, but the ptosis of the right side is so pronounced as to suggest the possibility of third nerve paralysis. In the absence of any symptoms of oculo-motor palsy other than the ptosis, I know of no way of differentiating in this case.

In the treatment, mercury, potassium iodid and arsenic

will be given a reasonable trial, and in the event of failure to improve, the entire chain of accessory glands will be excised from the fornix.

I am indebted to Dr. Buchanan for valuable assistance in collecting the literature upon which the deductions of this paper are based.

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MICROPHTHALMOS AND CONGENITAL ANKYLO-BLEPHARON—TWO CASES.

BY WALTER HAMILTON SNYDER.

TOLEDO, OHIO.

In making special examinations for the Pension Department I often find interesting congenital conditions of which I report the following:



NO. 1.

A. E., male, age 64. Served two enlistments. Vision now O. D. light perception; O. S. 6 in. /200. Condition is well shown in the accompanying illustration.

Right eye is very small. Complete aniridia. Anterior polar cataract. Complete ring of arcus senilis, and lens shows stellate opacity. Impossible to see fundus. Horizontal nystagmus.

Left eye. Same size of ball as right eye, incomplete aniridia. Lens congenitally absent, arcus senilis. Cornea steamy and

two facets in lower half of cornea. Fundus indistinct, using a. + 17 D. S. lens in ophthalmoscope, which is nearly the correct rough refraction. Nystagmus horizontal in this eye also.

It seems incredible that this man should have passed two examinations for enlistment and his defect not been noted. He is now an applicant for a pension for blindness, the result of service.



NO. 2.

J. M., male, age 66, Served one enlistment. Vision O. D. 20/120; O. S. 20/160. Condition imperfectly shown in attached photograph.

Right eye is microphthalmic. The lids are attached at both temporal and nasal side. Palpebral fissure measuring 22 mm. Congenital ankyloblepharon. Pterygium springing from nasal side and invading half of the cornea. Refraction about + 6.00 D. S. Nystagmus.

Left eye about same size as right eye same condition of ankyloblepharon, and a symblepharon-ptyerygium springing from the free border of outer half of lower lid and attached to center of cornea. Refraction about + 6.00 D. S. Nystagmus.

This man does not know whether any of his ancestors had this defect, but three of his five children have the same condition of ankyloblepharon. The oldest boy is normal, next

boy, next girl, next boy all have it and the youngest, a boy, is normal. This man also is applying for a pension for blindness resulting from service.

It is amazing to see the congenital defects, of which the above are samples, made the basis of application for pension. Hypermetropic and astigmatic eyes, now that the defects are manifest, are called blind, and nothing can convince the applicant that the defect always existed. The Government would save a large amount by refusing recruits, whose latent error is enough to reduce vision materially when it becomes manifest.

PARALYSIS OF THE UPWARD MOVEMENTS OF THE EYES.*

BY WM. CAMPBELL POSEY, M. D.

PHILADELPHIA.

PROFESSOR OF OPHTHALMOLOGY IN THE PHILADELPHIA
POLYCLINIC.

F. S., blacksmith, 48 years of age, came to the Wills Eye Hospital upon September 22nd of this year, on account of failing sight. He had been in attendance at the clinic a year previously on account of supraorbital headaches and general presbyopic symptoms, and had obtained a pair of glasses which gave him normal reading power in both eyes. The examination at that time showed normal fundi; the pupils were noted as being $3\frac{1}{2}$ mm. in size, and the irides responded promptly to light, but sluggishly upon convergence. No note was made of any limitation in the extraocular motions or of any unusual position of the head.

Corrected vision was normal in both eyes. The patient continued his trade until 3 months ago, when he was compelled to desist on account of attacks of vertigo. These attacks would come on suddenly, without premonitory signs, and were usually induced by change of posture. He had no headache, neither nausea or vomiting, and his body weight was well maintained. He was mentally depressed, however, most of the time. The patient denies specific infection but acknowledges masturbation. During 25 years he drank very heavily, being practically in a continual state of intoxication the most of that time; for the past 5 years, however, he avers that he has drunk nothing. He says that he never chewed, but that he has smoked about $1\frac{1}{2}$ package of tobacco a week since he was a boy. Although subject to slight rheumatic pain, he has never had a severe attack of rheumatism or of any other systemic disease. He has never

*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, Oct. 20, 1903.

suffered a traumatism or a fall. His family history is negative.

While sitting quietly upon the bench, waiting his turn to present himself for examination, the writer noted that the



Paralysis of the Upward Movements of the Eyes; showing widening of the palpebral fissures and lagging behind of the eye-balls, when patient endeavors to look up.

patient presented a peculiar fixity of gaze, which was found to be occasioned by the fact that the eyes were kept fixed in the primary position and that the patient moved them but

little to right or left but sat with his gaze directed straight in front of him. The patient looked anxious and changed the expression of his face but rarely. Closer inspection revealed that the head was thrown slightly back and that several mm. of clear sclera intervened between the margin of the upper lids and the upper limbus of both corneas. When requested to fix the examining finger held in front of the eyes and in the median line, the head was thrown further back and, as the finger was carried upward this was more and more marked, while the eyes remained fixed, not rotating above the horizontal plane. The palpebral fissures grew wider as the patient endeavored to look up (see accompanying photograph) and as the eyes lagged behind, the impression was given of an inverted Graefe lid sign. Lateral motions to the right and left were normal, though the eyes followed the movements of the finger somewhat tardily. Downward motion, too, was conserved, though rotation in this direction was accomplished with an effort and only after several trials. Convergence was lost, the visual axes of both eyes remaining parallel when the finger was made to approach the eyes in the median line; the internal rectus muscle of each eye, however, functioned perfectly in the associated motion toward right and left and also in the unassociated movements inward. In contradistinction to this, however, there were no upward movements in either eye when each was tested singly. The pupils were 3 mm. and were prompt to light but somewhat sluggish to accommodation stimuli. The fundi were normal, the nerves being of good tint. Corrected vision equalled 5/5 in each eye. The visual fields were normal, save for a slight concentric contraction for form and color in each eye.

When questioned further regarding the nature of the vertigo of which he particularly complained, it was elicited that he had never lost consciousness in the attacks, but that he is unable to stand, on account of extreme giddiness. He frequently has uncontrollable laughing fits at the time. There are no spasms during the attack, and though he falls he is able to rise again at once.

The patient was referred to Dr. Wm. G. Spiller, at the Polyclinic Hospital, for an examination of his nervous system. An abstract of the notes made by Dr. Spiller is as follows:—Speech indistinct, bulbar in character. Some

difficulty in swallowing during the past 3 months. The tongue is tremulous and there is a suggestion of atrophy upon the right side. There is no involvement of the 5th or 7th nerves. Sensation for touch and pain is normal in all parts of the body. Voluntary powers good in all the limbs. Sways slightly when standing erect, with eyes open, and still more with eyes shut. Biceps, triceps and most reflexes in upper limbs are probably a little prompter than normal. Patellar reflex is much exaggerated on each side. Achilles reflex are normal on each side. No ankle clonus. No Babinski reflex; toes on left side are not distinctly moved; toes on right side are flexed. No urinary disturbance.

The patient was placed upon massive doses of potassium iodid and mercury was pushed to salivation.

CASE II. Mrs. S. J. W., age 65, consulted the writer June 24, '97, on account of poor sight and dizziness following an apoplexy some 6 months previously. She said that her vision before the stroke had been good but that since that time it had been confused, especially on the left side. She had had no headaches. The dizziness was most pronounced upon rising. The apoplexy had affected the leg and arm of the right side, and the corresponding side of her face; speech was thick but not abolished.

Upon examination, it was found that neither eye could be rotated above the horizontal plane, though the other movements including convergence, were conserved. The pupil in the right eye was 3 mm., that of the left $2\frac{1}{2}$ mm. in size, and reacted very sluggishly both to light and accommodation stimuli. The fundi were normal, the nerves being of a good tint: corrected vision equalled $\frac{5}{6}$ in each eye. There was no hemianopsia, the extent of the visual fields being normal, save for a slight concentric contraction for both form and color.

Proper sphero-cylindrical lenses were prescribed to correct a moderate amount of farsighted astigmatism in both eyes and weak prisms were incorporated with them to overcome a slight (2°) vertical deviation. This formula relieved the dizziness and the patient passed from observation for nearly 2 years, when she returned for further treatment. An examination at that time showed that the eyes still remained fixed, stopping in upward movements at the horizontal plane

while the pupils manifested the same inactivity to both forms of direct stimuli.

Paralysis of one or more of the eye muscles is of daily clinical experience, but simultaneous palsy of corresponding muscles or groups of muscles in both eyes, and the abolition of one or more of the so-called "associated movements" is comparatively rare. The cases which have just been cited are instances of such a palsy, the associated movements of both eyeballs upward being lost in both, while in the first case there was in addition a complete paralysis of convergence.

In seeking for an explanation of these cases and for a review of the literature upon associated movement, the writer found his task lightened by a reference given him by Dr. Spiller, of a recent article upon this subject by Kornelow of Moscow (*Deutsche Zeitschrift für Nervenheilkunde*, Vol. 23, s. 417). This author reported 2 cases of palsies in the up and down movements of the eyes, in children, the eye lesions in one resulting from the polioencephalitis superior of Wernicke, and in the other from a tubercular deposit. In the first case, upward and downward movement were both lost, in the second upward motion was absent, and there was a restriction in the movements of both eyes to the left. Both cases exhibited other motor lesions, there being a slight paresis of the inferior branch of the facial and of the hypoglossus in the first case, and a paresis of the facial and of the right arm and leg in the second. Both had disturbances of speech and there was some ataxia of a cerebellar nature in both. The knee jerks were almost absent in the first case but increased in the second.

Sensibility and intellectuality were unaffected. After a careful search through the literature, Kornelow was able to find but 27 cases of associated palsies of the upward and downward movements of the eyes, and of these but twenty were available for study, owing to insufficient data in the others.

When tabulated it was noted that of these 20 cases, but 3 were unaccompanied by the involvement of other parts of the nervous system; convergence was lost in 7 cases and weakened in 3; a combination of palsy of upward and downward movement occurred in 8 cases. The pupils failed to

respond to light 9 times and to accommodation 4 times; they were unequal in 7 cases; diplopia occurred in 5. The optic nerve was affected 7 times (pallor of the disc, choked disc, hemianopsia, contraction of the visual field); the auditory in 3 cases. The abducens on one side or the other was paralyzed in 5 cases; ptosis occurred in 5; in 4 there was nystagmus. Paresis of the inferior branch of the facial was seen in 6 cases, hypoglossus in 2. There was hemiplegia or hemiparesis of the extremities in 8 cases. Disturbance of speech was noted in 6 cases and disordered gait in 8; 4 showed lessened cerebral activity. The etiology of these 20 cases was, generally speaking, unknown, though syphilis and diabetes were thought to be the causal factors in several. In half of the cases the affection came on suddenly, either as an apoplexy in aged individuals, as a consequence of a hemorrhage or softening, the result of an atheromatous process, or in the form of an acute affection, with headache, vomiting, stupor and increased temperature. In many of the cases the development was gradual. Recovery rarely occurred, the disease slowly progressing in nearly all instances.

But little is known of the pathological anatomy of the affection, but 10 or 11 cases having come to autopsy, and of these all could not be used to study the seat of the lesion causing such a combination of symptoms. Kornelow recalls that in order to effect a palsy of the upward motion of the eyes, the rectus superior and the inferior oblique of both eyes must be affected, and similarly, in downward motion, the rectus inferior and superior oblique; in the latter case he points out that both muscles are supplied by different nerves i, e., the oculo-motor and trochlearis, respectively.

Of the 10 or 11 autopsies, neoplasms were found in 8, and in only one "shrinking of the tissue as a result of previous softening." The tumors for the most part had not affected the corpora quadrigemina, but had involved neighboring parts, and even in the case in which the corpora quadrigemina alone were affected it was impossible to say that the surrounding tissues were not involved.

Several hypotheses have been advanced to explain the phenomenon of associated palsies. One of these, which has for its sponsor Parinaud, the eminent French ophthalmolo-

gist, is to the effect that associated palsies are not *nuclear*, but that they are occasioned by a lesion superior to the nuclei; in other words that they are *supra nuclear*. Kornelow objects to this theory, however, with the argument that it is not likely even though the nuclei of the oculo motorius and of the trochlearis lie in the floor of the aqueduct of Sylvius, and are thus likely to be affected in common, that a lesion would affect such a limited area as that part of the third or fourth nuclei which was concerned in the act of raising or lowering the eyes.

Kornelow believes that in order to explain the symptom complex of associated movements, it is necessary to suppose the existence of a *centre of co-ordination*, above the nuclei, i. e., in the corpora quadrigemina, palsies of such a character being then explainable either by an affection of the centre itself or of its paths of conduction. He is of the opinion that these centers are located upon both sides of the brain, each being under the control of both hemispheres. Supra nuclear palsies would result, therefore, from lesions affecting the centers or pathways of both sides of the brain only. All supra nuclear affections also are associated, though bearing upon this point Kornelow adds that it is because the centre of co-ordination lies, in all likelihood, near the corpora quadrigemina, that associated palsies so often occur in cases where the lesion is found at this point and not directly in the corpora quadrigemina themselves.

The fact that hysterical or psychic palsies are always of the associated type is in Kornelow's belief further argument of the supra nuclear origin of these cases, and likewise the absence of voluntary and the continuance of reflex movements seen in association with them, though he admits that the existence of these conditions, is alone conclusive, and their absence of no import. In conclusion, he calls attention to the fact that associated movements may result from peripheral disease, and points out the importance of discriminating between symmetrical and asymmetrical clinical manifestations, attributing all the latter to lesions below the supra nuclear region.

Regarding the seat of the lesion in the two cases which have been reported by the writer, it is probable that both should be assigned to the region of the corpora quadrigemina.

Remarks by Dr. Wm. G. Spiller made in the discussion which followed the reading of Dr. Posey's paper.

Lateral conjugate movements of the eyeballs are, at least in part, under the control of the cerebral cortex. Lateral deviation of both eyeballs is not uncommon in cerebral hemiplegia, and in such cases we are accustomed to say that "the patient looks at the lesion." It is also well known that when irritation of a certain part of the cortex of one cerebral hemisphere occurs the eyeballs may be turned away from the irritated side. The position of this cortical center for lateral conjugate movement of the eyeballs is not definitely known, but it is near the other motor center more probably than in the angular or supra marginal gyrus. The center for the movement of the head to one side is in the motor area, and the deviation of the eyeballs is so frequently associated with the deviation of the head, that it is reasonable to suppose that the centers for these movements are near one another.

Lateral conjugate deviation of the eyeballs when caused by a cerebral lesion, either irritative or paralytic, is usually of comparatively short duration. This would seem to indicate that one cortical center can not have the sole control of these movements, and it may be that the representation of lateral conjugate deviation is bilateral in the cerebral cortex, and that it would be necessary for both cortical centers to be destroyed before persistent lateral conjugate deviation could occur from cortical lesions. The connections of these cortical centers with the nuclei of the oculomotor and abducens nerves is unknown, and it is hardly worth while to mention the different bands of fibers supposed to form this connection.

If we assume that there is a cortical center or centers for lateral conjugate deviation, we may as reasonably assume that there are similar centers for upward and downward conjugate movements of the eyeballs. I am not aware that conjugate deviation of the eyeballs in either of these directions has been observed in lesions of the cerebral cortex, and the reason for the absence of this form of deviation may be that the upward and downward movements of the eyeballs probably are more equally controlled by the centers in both sides of the cerebral cortex.

It is certain that persistent paralysis of lateral conjugate movements of the eyeballs may be caused by a lesion of the pons, and this form of conjugate paralysis is better understood than is the paralysis of conjugate upward or downward movement, because cases with necropsy illustrative of the former condition have been more numerous. A few cases have shown that the paralysis of lateral conjugate movement of the eyeballs may be caused by a lesion destroying the connection between the sixth nucleus of one side and the third nucleus of the other. A case that I have been able to observe clinically with Dr. C. S. Potts, and to study by microscopic sections, has shown that implication of the posterior longitudinal bundle may cause paralysis of lateral associated movement. The patient had complete paralysis of the left external rectus muscle, and was unable to move either eyeball to the left, but the contraction of the right internal rectus was good in convergence. A solitary tubercle was found in the left half of the pons, destroying the left posterior longitudinal bundle and compressing the fibers of the left sixth nerve within the pons, but not invading the nucleus of the left sixth nerve.

This paralysis of associated lateral movement of the eyeballs is so important a clinical sign, that with other symptoms indicating a lesion of the pons I believe that the paralysis of the lateral associated ocular movement points clearly to the *intrapontile* character of the growth, and puts operation out of the question.

The paralysis of upward or downward conjugate movement of the eyeballs is more difficult to understand. Most clinical cases are complicated by symptoms compatible with a lesion in the region of the corpora quadrigemina. In Dr. Posey's first case that I examined I found vertigo, some ataxia, a peculiar bulbar speech, exaggeration of tendon reflexes and paralysis of convergence.

Tumor is probably the most common cause of any form of paralysis of conjugate movement of the eyeballs, and in a number of cases the tumor has been a solitary tubercle, but the paralysis of upward or downward conjugate movement probably may be caused by the polioencephalitis superior of Wernicke. The seat of the lesion in the paralysis of upward or downward conjugate movement is probably in the corpora quadrigemina.

SUGGESTIONS AS TO POSTMYDRIATIC REFRACTION TESTS.

BY GEORGE M. GOULD, A. M., M. D.

PHILADELPHIA.

The reasons why "glasses fail to give relief" are many, and I have elsewhere formulated sixty-eight. When my patients go to other oculists I am always anxious to secure the records of work done and prescriptions ordered by them, so that I may learn what my mistakes have been, and thus be on my guard in future cases. Nothing is so instructive to the physician and helpful to the patient as the willingness to correct one's own errors "relax one's own accommodation" and gain guidance and rules for future use. In studying my own case records and those of patients who have been treated by other oculists, I constantly come upon the fact that we have in the past paid too scant attention to the postmydriatic tests before prescribing glasses. Many oculists indeed do not make such tests but prescribe while the eyes are still under the cycloplegic. One well-known oculist writes me that he does not use a cycloplegic at all because he finds such wide, frequent, and contradictory changes between the results that he can do better without the cycloplegic. This seems to me a profound error.

The differences between the refraction under cycloplegia and that after the accommodation-paralysis has passed off, are indeed marked, frequent, and even contradictory, and I estimate that these differences will be found in from 10 to 20 per cent. of cases. They may possibly be due:

1. *To the kind of cycloplegic used.*

The stronger and more lasting ones, I judge, cause the greatest differences. Homatropin and cocain (combined) are the least liable to cause them.

2. *To the method of instillation, purity of the drug, etc.*

Used in the office for one hour prior to the tests, about every seven minutes, seems to me to give the best results.

3. *To the time at which the tests are made.*

They should be made at the height of the physiologic effect of the drug, not before or after.

4. *To the hyperemia caused by the drug, the differences in physiologic conditions due to it, etc.*

These may readily cause changes in corneal curves, tensions in muscles, etc.

To these causes may be added the following:

5. *To the inclination of the axes of vision when the tests are made.*

Most of our looking, and especially all straining work, reading, writing, sewing, etc., is done with the axes directed downward. Our tests in the oculists' offices, under cycloplegia, are usually made with the 20-foot cards on a level with the eyes. I have seen oculists' offices in which the cards were even considerably higher, making the axes incline upward. It seems evident that the muscular tensions in looking on a level or downward may frequently be so different as to change corneal curves, etc. When in conjunction with the next cause, as practically this factor must be taken, we have a possible source of changes of high importance.

6. *To the fact of whether the test is made at the 20-foot or the 14-inch distance.*

The muscular tensions are certainly different in the two locations of the object fixed upon, and this, especially in cooperation with the preceding cause, may result in marked changes of astigmatic axes or amounts, etc.

7. *To the fact per se of paralysis of the ciliary muscles and conversely of the full exercise of accommodation without cycloplegia.*

A different result, sometimes existing, seems to be ascribable to the direct influence of active or paralyzed accommodation, the mechanism being difficult to understand.

8. *To the well-understood difference in refraction of the central parts of the cornea and of those more peripherally located.*

The test with the pin-hole disc brings this out in cases of doubt.

9. *To the influence of binocular fusion,*

There is sometimes a change of the axes of astigmatism when both eyes are in function from that made with the monocular test,

10. Torticollis, or Tilted Head; a twisted and tilted position of the head may be caused by a displacement of the axis of astigmatism of the dominant eye.

I have discovered about 35 such cases among my patients during the past four months*, in many of which there was secondary spinal curvature, all demonstrably due to an axis of astigmatism in the right eye from 10° to 20° out of symmetry. When the head was kept perfectly erect the misplaced axis was manifest. In the erect position the patient was "unable to see" with the axis chosen when the head was inclined to the former habitual position, and vice versa.

The practical lesson I have drawn from these ten considerations is that in cases of doubt, or failure to relieve eye-strain reflexes, and in all cases of unsymmetric astigmatism, retests should be made, under cycloplegia and with great care; but especially as regards the postmydriatic tests with the accommodation spurred to its utmost; with near-tests in the reading position; in the cases of canted or twisted heads; and with both eyes open at near and distance,

These ten reasons should have been added to the sixty-eight already enumerated,† making seventy-eight in all, "why glasses failed to give relief."

*See *American Medicine*, March 26, 1904.

†See "*American Medicine*," July 4, 1903, and "*Biographic Clinics*," Volume II.

PEMPHIGUS OF THE CONJUNCTIVA, WITH REPORT OF A CASE.

BY S. H. BROWN, M.D.

PHILADELPHIA.

The infrequency of pemphigus, both in this country and abroad, is such that the occurrence of isolated cases is always of great interest. In England and America the disease occurs about once in 500 cases of skin diseases. Kaposi has shown it to occur about once in 210 cases and Crocker 4.4 in 1,000 cases. The condition may be acute or chronic, a number of clinical varieties of which are recognized. It is characterized essentially by the formation of blebs which make their appearance in successive crops without antecedent lesions. The bleb of pemphigus has tense walls and translucent contents and is devoid of inflammatory areola or any special tendency toward grouping. The size varies, but the majority of the lesions are from one-quarter to an inch in diameter. Large bullæ usually result from a coalescence of the smaller lesions. They make their appearance in crops at intervals of a few days and are usually preceded by itching or burning. The contents of the blebs are at first clear, but become turbid from the presence of pus, or may become dark from effusions of blood. All parts of the body surface are affected, including the mucus membrane of the eye, nose, mouth, vagina, etc. There is always more or less impairment of health and the affection often terminates fatally. The etiology is obscure. Most cases are referred to some derangement of the nervous system. Acute cases have in a few instances been traced to septic wounds. In infants and young children the affection has occurred in epidemics but the microorganisms responsible for the contagious nature of these cases have not as yet been isolated. The staphylococcus aureus and a special diplococcus have been found in a few cases of pemphigus neonatorum. While the condition occurs in both sexes, no age seems exempt, it, however, shows a predilection for

females and young children. Defective kidney elimination is held by some to be a factor of importance, as in a few acute cases organic nephritic disease has been found associated with the affection. The infectious fevers are in occasional instances followed by the acute form of the disease. As in other diseases of a similar nature manifested by bullous eruptions, eosinophilia and a reduction in the red blood cells have been noted.

The bleb is undoubtedly due to sudden effusion of serum from the vessels of the corium probably secondary to paralysis and dilatation of the same. The roof-wall is usually the upper horny layer and the base, the rete mucosum. A slight degree of inflammation attends the early stages. The papillae are edematous; the vessels are dilated, and there is an emigration of the polynuclear leucocytes together with a serous infiltration of adjacent tissues.

The number of conditions such as dermatitis herpetiformis, erythema multiforme, impetigo contagiosa, syphilis (infantile), urticaria bullosa, etc., attended by bleb formation are likely to confuse one in the diagnosis, but the characteristics of the lesions, the large, tense, abruptly elevated, non-inflammatory blebs which appear in crops should enable one to make a distinction between these affections.

Acute cases of a mild type unattended by constitutional disturbances may recover in a few months but the course of the affection is never certain. Extensive distribution, hemorrhagic blebs, constitutional manifestations, etc., are unfavorable signs. Fatal terminations are by no means infrequent. In chronic cases, the duration is greater and relapses are frequent. The ultimate outcome is influenced by the same factors as in the acute form.

Pemphigus, particularly the form known as pemphigus vegetans, may also attack the mucous membrane of the eye, mouth, pharynx, larynx, nose, etc. Occasionally, the affection is encountered on the mucous membranes exclusively. As a result of the lesions in these various situations, adhesions form between opposing surfaces, especially in the conjunctiva to which von Graefe has applied the term "essential shrinking of the conjunctiva." This condition also occurs independently of pemphigus.

The case I wish to report was characterized not only by

typical lesions upon the skin but also upon the mucous membrane. The patient is a woman 48 years of age, who presented herself for treatment, March 3rd, 1902, for what appeared to be acute catarrhal conjunctivitis, together with excessive hemorrhage from the nose and vagina. The conjunctivitis readily responded to treatment, but was followed by some encroachment upon the fornix. The vaginal hemorrhage suggested malignant disease, and two gynaecologists were consulted independently, one of whom diagnosed carcinoma, the other fibroid of the uterus. The hemorrhage was finally controlled by the internal administration of large doses of strychnine and ergotine and has not returned since. The epistaxis was periodic and most obstinate. Areas of erosion were detected upon the mucus membrane, treatment of which failed to afford any relief whatever. Careful examination of the nasal fossae and the nasopharynx failed to reveal any other cause for the bleeding, which was only controlled by the formation of clots. This diminished gradually but still persisted until a few weeks ago. In the early part of April, 1903, after a severe attack of nervous prostration, the epistaxis became worse and the conjunctival condition recurred. The patient was at this time a considerable distance from Philadelphia, but consulted me as soon as she was able to travel. Examination at this time showed large vesicles and blebs scattered over the entire surface of the body and especially on the fingers. Here they became purulent, resembling impetigo contagiosa. One of the fingers became the seat of septic inflammation shortly afterward. Large blebs were formed within a short period upon the mucous membrane of the mouth where they soon became hemorrhagic. The lips became intensely swollen, interfering greatly with the taking of nourishment. Examination of the nasal passages showed a similar condition, but at no time were distinct blebs seen.

In the conjunctiva it was possible to find large flakes of partially detached mucous membrane which probably formed the roof of some of the blebs, the friction and pressure of the lids no doubt inducing rupture of the blebs shortly after their formation. As each flake was discharged the fornix was noticed to lessen in size and the ability to open the eyelids became markedly diminished. The range of motion of the

eyeball became likewise diminished as a result of this shrinking of the conjunctiva.

In a very short time, despite treatment, the patient was able to see only by looking downward through a very much narrowed palpebral fissure. At the end of a month the shrinking attacked the corneal epithelium and was erroneously attributed to the adrenalin which had been employed locally. Within a few days a vesicle formed on the cornea of the right eye and was soon replaced by a small ulcer. The patient at this stage was taken very ill, necessitating confinement to bed. During all the preceding treatment progressive general weakness was noticed. While confined to bed another finger became infected, and the necessity of its amputation was considered, but it eventually went on to resolution without any operation. During this period, large crops of blebs, varying in size from $1/8$ to $1/2$ an inch in diameter, made their appearance all over the body and also in the mouth and nose. The eyelids became swollen and vision was impossible for a period of ten days. Treatment was of no avail in any direction, and the advice of another physician was sought. The ocular condition was ignored by my successor, and when I was again consulted six weeks later, a corneal ulcer was discovered on each eye, and the shrinkage of the conjunctiva was markedly pronounced. The ulcers are both central, that upon the left cornea was perforated and the iris is entangled in the cornea. The tension of this eye is minus. The remaining portions of both cornea are clear. The patient's condition varies from day to day—new crops of tense blebs appear and disappear, and when the mucous membrane of the mouth is free the general health seems to improve on account of the ability to partake of food at these periods. Sometimes it is possible to demonstrate vesicles on the cornea, but they are of very short duration. On the whole the prognosis is bad in this case, taking into consideration the age of the patient and the location and hemorrhagic tendency of these blebs. The general health has failed to a marked degree, and the termination will undoubtedly be death from exhaustion although the duration of the affection is very indefinite.

NOTE—Since recording these notes the patient has died, six months after the first well-marked eruption of blebs. A post-mortem examination was not obtained.

OBSERVATIONS ON THE PATHOLOGY OF THE CRYSTALLINE LENS.*

BY EDGAR S. THOMSON, M. D.

NEW YORK.

From the Laboratory of the Manhattan Eye and Ear Hospital.

The crystalline lens is an epithelial structure composed of thin fibre-like cells, shaped like somewhat flattened six-sided cords, the whole enclosed in a dense homogeneous capsule. It is developed from two layers of invaginated epithelium in the embryo, the posterior of which soon changes the character of its cells which become elongated and form the bulk of the lens substance. The anterior remains as a single layer of cuboidal cells which is for the most part unchanged through the life of the individual. The posterior layer goes on germinating until the fibres assume the position characteristic of the fully formed lens, stretching from the anterior to the posterior pole. The fibres are arranged in such a manner as to form by their lines of junction the characteristic stellate figures on the anterior and posterior surfaces of the lens. The anterior of these figures is often plainly visible by oblique light in clear lenses of the aged, and is the more marked, the more the fibres are sclerosed and shrunk. The lens fibres are set closely in apposition and are said by many authors to have minute quantities of cement substance in between them. This cement substance, however, must be extremely weak in its action as splitting apart of the fibres is so common a condition; and in fact if the fibres were held rigidly together the act of accommodation would be interfered with. The lens continues to grow all through life by the proliferation of the epithelial cells at the equator, and as this is only partially compensated for by the shrinkage and sclerosis of the nucleus, the size of the lens increases continually. After the fibres are of a certain age degenerative changes invariably set in, caused by the imperfect nu-

*Read before the Section on Ophthalmology at the N. Y. Academy of Medicine, Dec. 21st, 1903.

trition afforded the fibres through the dense lens capsule. As would naturally be supposed, the central fibres being the oldest are the first to become affected.

The first change is a loss of the fibre nucleus which disappears by a process of resorption, the exact nature of which is somewhat obscure. At birth the nuclei have largely disappeared and only show in the anterior sub-capsular epithelium and at the equator or zone of transition, where active proliferation is still going on. The central fibres in childhood already begin to lose their watery elements and shrink. This shrinkage or sclerosis goes gradually on until in the adult a small nucleus is formed in the lens. This nucleus goes on growing larger and ultimately includes nearly the whole lens. The fibres which have not undergone this sclerosis are usually spoken of as the cortex of the lens.

The lens capsule is a dense structureless membrane which seems impervious to cellular invasion under ordinary conditions, and which only permits the passage of such elements of the lymph stream as are needed for the nutrition of the fibres. Norris, in his article on the lens (*System of Diseases of the Eye*. Vol. IV., p. 296) suggests that there may be channels of escape through the capsule along the insertion of zonular fibres. Be this as it may, the most active portion of the lens, both as regards proliferation of the cells and the rate of absorption of the nutrient aqueous, is the equator, as has been well demonstrated by numerous observers and as is constantly suggested by the pathological changes found there.

The various forms of lenticular opacity occurring in senile or in complicated cataract may be briefly summarized.

1. Anterior capsular deposits.
2. Anterior subcapsular degenerations.
3. Cortical degenerations.
4. Nuclear degenerations.
5. Posterior cortical degenerations.
6. Posterior capsular opacities.

In all of these cases except possibly in the case of certain opacities upon the capsule, there is always a tendency for the degenerative changes to progress until the entire lens is involved, although the rate of progression is often extremely slow.

Cortical opacities, whether anterior or posterior, are perhaps most usually followed within a short space of time by a total degeneration and opacity of the lens, though to this there are two exceptions: The form known as lamellar cataract, a congenital variety, commonly remains stationary until advanced years; and the variety of senile cataract beginning with narrow radiating lines extending from the periphery, being an indication of a sclerotic condition of the lens rather than an active degeneration of the fibres, is also of extremely slow development.

1. *Anterior capsular deposits* which often have much to do with the degeneration of the lens, are formed by fibrinous exudates from iritic inflammation. These may or may not be complicated by an adhesion of the iris, and vary greatly in extent. Very small deposits cause no disturbance to the resistant capsule, but if the deposit is large when it reaches the stage of contraction there is sure to be more or less wrinkling of the capsule with consequent disturbance of the tissues beneath. Where the process is slow, the irritation is followed by a proliferation of the sub-capsular epithelium which in some cases, as in anterior polar cataract, takes on growth which appears more like fibrous than epithelial tissue. If the epithelium has time to fill in the inequalities in the tissue, there is only a circumscribed opacity formed, while if the wrinkling of the capsule has taken place more violently, especially if it has been caused by the tugging of an iris-adhesion, or perhaps by too forcibly tearing the iris loose from the capsule in the performance of an iridectomy, there will be an artificial separation of the fibres with resulting softening and ultimate total cataract. In this manner are formed cataracts which so commonly result from severe cases of iritis with extensive posterior synechiae.

2. *Anterior sub-capsular* opacities are composed of two distinct elements: First, proliferated epithelium which has undergone what may be called a fibroid change; and, second, true degenerations of the lens cortex. Proliferation of the sub-capsular epithelium is not at all uncommon and occurs from mechanical irritation, as has been mentioned, and also as the result of nutritive changes in the lymph stream. It is common to find several layers of epithelium in cases of iridocyclitis, chorioidal sarcoma, or in any case where there

are exudates thrown out near the equator of the lens. These proliferations occur early, before the formation of fibrous tissue, and must be ascribed to chemical changes in the lymph stream rather than to any mechanical cause. They do not give rise to any opacities perceptible with the ophthalmoscope—at least, as long as the epithelium does not degenerate.

The most familiar examples of proliferated epithelium which undergoes fibroid changes have already been given.

The ordinary anterior polar cataract belongs to this class and is largely the result of the traction on the lens capsule.

3. *Cortical degenerations* form by far the largest class of pathological variations in the lens, in fact, in many cases the cortex is the primary seat of the lens degeneration known as cataract. They occur in two ways which are often associated one with the other. Perhaps the more common is associated with shrinkage and sclerosis of the nucleus, causing separations between the cortical fibres which become filled with a granular material. These changes are in their nature extremely slow and at first may cause no perceptible opacity of the lens, though ultimately the lens fibres undergo degeneration. A common example of this is in the sector like opacities, superficially situated, which run in from the equator, and which so commonly exist for months or even years with only the slightest signs of progression. Perhaps, on account of the more central situation of the fibres and their inaccessibility to the nutritive stream, separations deeper in the cortex are more apt to be followed by early degeneration of the surrounding fibres. In fact, these separations caused by shrinkage of the nucleus are the most constant feature of progressive senile cataract. These separations become filled with a homogeneous substance which soon becomes granular and coagulates, forming the so-called spheres of Morgagni. The fibres bounding the fissures may remain in fairly normal condition for some time but usually degenerate in one of several ways: They swell up and become granular, finally breaking up into the spheres of Morgagni; or they undergo fatty degeneration and break down, becoming ultimately semi-fluid detritus in either case. Often drops of fluid collect between or within the cells. During these changes it is not uncommon to find nuclei in the cells in places where

they are normally non-existent. The origin of these nuclei is not always readily to be traced, but they have been repeatedly found in the fibres where the capsule was, so far as could be determined, intact, and they undoubtedly arise from proliferation of the epithelial nuclei in the fibres. This proliferation takes place to a limited extent in all cases of senile cataract, and seems to be nature's effort to repair the loss of substance in the lens. In cases where a rapid degeneration of the lens fibres occurs it is usual to find large masses of nucleated, spindle shaped, epithelial cells which may be looked upon as imperfectly formed new fibres. Sometimes this growth is astonishing in its extent and activity—as where a severe lens infiltration of leucocytes occurs in the course of an infectious iridocyclitis with an open wound of the capsule. We always find evidence of proliferation of the fibres in the remains of the lens which is left in “pockets” of the capsule, chiefly at the equator, after a cataract extraction. This proliferation does not come entirely from the anterior capsular epithelium, but from the fibres themselves which have not lost their nuclei. In fact, there is usually no effort on the part of the anterior epithelium to form large lens fibres—at least at the anterior pole. It is only when we get close to the equator in the zone of transition that we find the spindle-shaped cells of lens regeneration.

The symptoms of swelling of the lens with decrease in the depth of the anterior chamber depends mainly on the rapidity of the fibre degeneration. In cases where the fibres swell up rapidly and become cloudy all through the cortex, as we see in senile cataracts, which mature in a period of about two years or less, we shall usually find a stage of swelling as shown by the shallow anterior chamber, during which stage operations are likely to be attended with difficulty on account of the large amount of soft cortex present. No doubt the fibre proliferation which accompanies rapid degenerations, is also a factor in this swelling of the lens. The swollen fibres ultimately shrink somewhat and lose part of their watery constituents before they finally break down into Morgagnian fluid, and it is during this latter stage that operation is most easily performed.

In cataracts of slow development the swelling of the fibres

is often so slight that the difference in the depth of the anterior chamber is almost imperceptible. In the latter stages of senile cataract the cortex is converted into a milky fluid in which the nucleus floats. It is a well known fact that such cases are prone to develop a disastrous iritis after the operation, and it is impossible to escape the idea that some chemical substances are formed within the capsule, which when liberated are intensely irritating to the iris.

Fuchs considers that cholesterine is the most important of these. In cases of this kind irrigation of the anterior chamber and capsule seems almost a necessity. There must also be some cause for the chorioidal degenerations which occur when hyper-mature or Morgagnian cataract is allowed to remain undisturbed, and there is a question whether the products of lens degeneration may not, by being taken up into the ciliary and chorioidal circulation, produce sufficient irritation to cause these changes.

4, *Nuclear changes* where they occur separately as such, are almost invariably sclerotic. The nuclear fibres being farthest away from the sources of nutrition, shrink and become dense and firm through loss of water. An analogous change is frequently observed in hardening lenses artificially, especially in the case of glaucoma where the lens nutrition is probably defective. If such lenses are not hardened very carefully they shrink and lose the watery contents of the fibres, and it is impossible to get any details in the lens structure.

5. and 6. *Posterior cortical and capsular opacities* occur, as in anterior changes, where plastic exudates occur upon the capsule, causing superficial changes through shrinkage, and also as the result of shrinkage with degeneration in the fibres themselves. While anterior and posterior changes secondary to pathological conditions of the other tissues occur independently, it is usual in senile cataract to find the changes quite symmetrical.

TRAUMATIC CATARACT.

The pathological changes in cataract caused by a penetrating wound of the capsule or by a contusion, differ from those already mentioned chiefly in the great rapidity of the degenerative processes. Where the cell wall is broken by a rent in the capsule the

cell contents immediately swell up and disintegrate and are carried off in the aqueous stream. The degeneration spreads rapidly to all the fibres, which become first striated, then opaque and cloudy, finally breaking up into spherical masses of detritus. These masses swell by imbibition of aqueous and protrude through the rent in the capsule into the anterior chamber where they are absorbed. The rapidity with which these are absorbed depends upon the activity of absorption of that particular individual, and it is a matter of common observation that this varies widely, even in individuals of the same age and apparently similar constitutions. Absorption is always slower, the older the patient.

Whether a cataract, after a traumatism, ever occurs without rupture of the capsule is a disputed question, and the difficulties in solving such a question will be at once apparent. Without having any data of my own to guide me, I am inclined to believe that rapid degeneration of the lens after a traumatism always comes from some capsular rupture, however small. The opacities which come in a dislocated lens are sometimes very slow to appear and rapid opacity suggests therefore rupture of the capsule, while a slow degeneration of the lens occurs commonly as a result of contracting exudates cutting off the nutrition of the fibres. This we see in cases where the lens is luxated on the ciliary body and bound down by plastic material. Such lenses become opaque much sooner than those luxated into the anterior chamber, which may remain clear for a long period.

In subconjunctival dislocation it is readily seen that the lens is cut off from its proper nutrition, and degeneration of the fibres inevitably follows, but even in these cases the degeneration usually begins in some part of the lens directly exposed by connective tissue contraction.

Where the lens is invaded by masses of leucocytes, as we frequently see in infective wounds, the fibres are rapidly broken down and destroyed and ultimately nothing remains but a mass of fibrous tissue. Not every penetrating wound of the capsule is followed by total lens degeneration. It happens rarely that a layer of fibrin is formed which binds together the margins of the capsular rent before degeneration has taken place (Schirmer quoted by Norris, *System of Diseases of the Eye*, Vol. IV., p. 302.) In such cases we

have only a circumscribed lens opacity left, which may remain practically non-progressive for an indefinite period. In one such case which I have observed clinically, a small chip of steel passed entirely through the lens and was afterward removed by the magnet through a scleral incision. The capsular openings closed, and four months later the area of opacity had cleared so that there only remained the two cortical opacities anterior and posterior, without a trace of the opacity between. This case, however, was certainly very exceptional, and it is most probable that there will be further degeneration of the lens fibres as time goes on.

A rather peculiar form of degeneration is hernia of the lens fibres through a corneal ulcer in certain forms of purulent keratitis, where there has been entire destruction of a portion of the cornea. The lens fibres gradually come forward through the opening, forming a knob-like projection. This is composed of swollen and disintegrated lens fibres covered by intact capsule. The explanation of this condition seems to lie in a weakening of the capsule through lessening of its resistance. It stretches rapidly and the space is at once filled up with swollen fibres which undergo the usual proliferation. The rapidity of the process is indicated by the splitting and distortion of the deeper fibres. In the case shown there was marked increase of tension in the vitreous, which may have operated as a factor in the production of the hernia.

MEMBRANOUS CATARACT.

What is commonly known as membranous cataract, or secondary cataract, appears clinically after the removal of the lens, and is a more or less dense membrane stretching across the pupillary space posterior to the iris. It may be composed of several elements—lens capsule, lens fibres, which have not undergone complete degeneration, proliferated epithelium from the anterior capsule, fibrous tissue from iris exudates, and thickened fibrous elements from the anterior layer of the vitreous body.

After an operation for senile cataract, the posterior capsule is usually the only one which remains in the pupillary space, and if there is no iris exudate thrown out, complete degeneration and absorption of the cortical fibres takes place

and no membrane remains. The lens capsule, while it acts as a basis for the membrane, never becomes opaque itself. The cortical fibres remain only where they are protected by fibrous exudation from the iris, or by a portion of the anterior capsule folding over and keeping the aqueous from contact with them.

Where a portion of the anterior capsule remains, the epithelium may proliferate and take on the same thickened fibrous change as in the anterior polar cataract. This, however, is not very common except at the equator, as the cystotomy usually opens the capsule widely and allows the cut portions to retract.

The most important element in the composition of membranous cataracts is undoubtedly fibrinous exudation from the iris. This always occurs if the reaction following the operation is of the slightest degree, and the presence of the resulting connective tissue makes the secondary needling operation difficult.

Almost every surgeon has his own ideas as to the best means of operating upon such membranes, but in general it may be said that the operative procedure which accomplishes the desired result with the least pulling of the membrane and its attachments to the ciliary body, is the most desirable. Frequently we see membranes following cataract extraction which seem very gauzy and thin and easily torn. A small needling operation is done, and the next morning, although the eye may show no reaction whatever, a number of gauzy shreds will be seen waving back and forth in the anterior part of the vitreous, being attached to the posterior surface of the membrane. These small portions of membrane are most probably thickened portions of the hyaloid and anterior portions of the vitreous. They commonly shrink up as time goes on, but they oftentimes interfere with the immediate success of the needling operation. It need hardly be said that such eyes come before us very rarely for microscopical examination, but we frequently find in enucleated eyes thickening of the fibres in the anterior part of the vitreous immediately posterior to the lens, and reasoning by analogy it seems probable that we have a similar condition in membranes of this clinical variety.

HISTORIC NOTE REGARDING THE OPTIC CHIASM, AND SOME POINTS REFERRING TO MON- OCULAR AND BINOCULAR VISION.*

BY DR. M. MARQUEZ.

MADRID.

TRANSLATED FROM THE SPANISH BY DR. FRANK RING,
OF ST. LOUIS.

At present the old and much disputed question of the inter-crossing of the optic fibres appears to be completely and definitely determined by the investigations of Cajal.†

We now possess the direct anatomic proof as well as the indirect proof based on the functional requirements for binocular vision, as well as the pathologic facts observed in man.

The reference to this affair in the order of scientific investigations is then purely historical. And this is precisely what I propose to present to this society in this note.

The older authors have given forth the most diverse opinions as to the existence or non-existence of the crossing of the optic nerves. It is not now my intention to give a detailed history of these, which will be covered in a later note, but I will limit myself by reducing them to the three following:

1st. The optic nerves do not cross. (Galen, Vesalius, Maitre-Jean, Demours, Jr., etc.).

2nd. The optic nerves inter-cross entirely. (Soemmering, Brisadecki, Mandelstamm, Kölliker, until 1899).

3d. The optic nerves inter-cross partially. (Newton, Taylor, Wollaston, Müller, Gudden, Cajal).

The latter is that which has prevailed, and to this we will refer in the historic investigations contemplated by this article.

*Article presented to the Spanish-American Ophthalmological Society.

†Structure of the optic chiasm and general theory of the inter-crossing of the nerves. *Archivos de Oftalmologia Hispano-Americanos*, March, April and May, 1901.

In reality, the first who formulated the hypothesis of the semi-discussion was the physicist and mathematician, Isaac Newton, who published in 1704 the first English edition of his work on optics.

In Book III, Question xv is formulated and answered as follows:

"Do the images seen with both eyes, unite in the place in which the optic nerves meet before entering the cerebrum?"

"The fibres of the right side of these nerves unite in the chiasm, and they go together to the cerebrum by the nerve which is in the right side of the head, and the fibres which are in the left part of such nerve, unite also in the same place, marching afterward together to the cerebrum through the nerve which is in the left part of the head, so that the two posterior nerves are united in such a manner in the cerebrum that their fibres constitute there a single image, of which the half that is in the right side of the sensorium comes from the right side of the two eyes through the right side of the two optic nerves, and the half which is on the left side of the sensorium proceeds in an analogous manner from the left part of both eyes. Then the optic nerves of those animals which look at the same place with both eyes (like man, dog, sheep, ox) join into one before entering the cerebrum, while the optic nerve of those animals which do *not* look at the same place with both eyes (like fish and cameleons) do not unite nor mix their fibres, if I am not badly informed."

As may be seen, Newton limits himself to exposing, without demonstrating, the hypothesis, with the sole object of explaining simple vision with the two eyes, admitting that in the said unique image, the half corresponds to one side of the cerebrum and the other half to the other side of the cerebrum.

In so much as the final paragraph refers to the optic nerves of fishes and cameleons, it is totally inexact. It is true that Newton speaks in this by references, and not in affirmative tones, as some have attributed to him. And here comes the most interesting part of this historical work.

In none of the ancient or modern works which I have consulted do I meet the name of the celebrated Englishman, Taylor, "Oculist to the King of Great Britain," as he calls himself in the title sheets of his works. He lived from 1708 to 1772, according to dates given by Antonelli, in a recent

work entitled, "An historical point regarding the operation for strabismus." In this work the author occupies himself in demonstrating that Taylor contributed nothing and was not at all the inventor of myotomy in strabismus, and that the famous operation which he went about exploiting from city to city with the object as he affirmed of "straightening crossed eyes" was nothing but the proceeding of a charlatan,

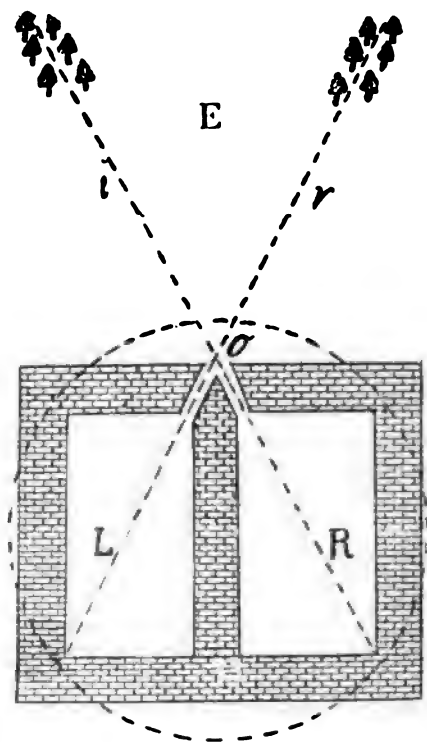


Fig. 1.^a

neither the first, nor unhappily the last, in the history of medicine.*

*The proceeding according to Lecat consisted simply in passing a needle, with silk thread, in the lower part of the globe, making a hold with which he drew toward himself the conjunctiva, which he then cut with the scissors; following this, he put a plaster over the good eye, consequently straightening the strabismus. Then enjoining that the other eye be not uncovered, he went in the meantime, to another city. When the good eye was uncovered, the other returned to its former bad position.

Whether the censures of our distinguished colleague against Taylor are merited or not, we must still recognize in him exceptional conditions of intelligence, as may be seen in his works, which are, at times, full of ingenuous comparisons and written in an attractive and winning style.

A happy accident has placed in my hands one of them, entitled "The Mechanism, or New Treatise of the Anatomy of

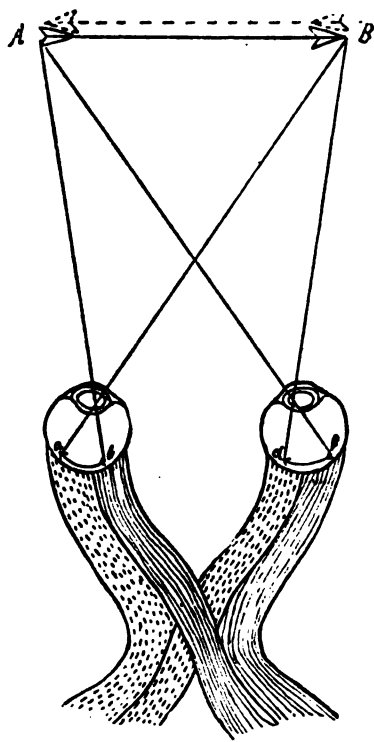


Fig. 2.^a

the Globe of the Eye," printed in Paris in 1738, which is the same which Antonelli has examined, and according to the latter, reviews all which the author had previously published regarding this matter. In this work are two chapters of undoubted value, the one (Chap. XXII) entitled, "The reason why objects appear straight, although their images are pictured reversed upon the immediate organ of view," and the other (Chap. XXIV) "The reason why one sees only one

object with the two eyes, although each eye in particular receives an image of this same object; double vision and strabismus." These and very singularly the second will give us an idea, at once, that will make us critics of their contents in the light of actual knowledge.

As to the first chapter, although it does not relate directly to the optic inter-crossing, it is, however, so interesting as to merit mention. In it Taylor, after citing the demonstration that in the fundus of the eye is really formed an inverted image, making the experiment with the eye of an ox and a candle, says the following: "This phenomenon has always embarrassed those who believe that inverted images are incompatible with the direction of the view, except that some cause not yet discovered may not convert them into direct images before we perceive them; but if this was true the following absurdity would result, that is to say, that the soul would serve as an invisible eye or intermediary instrument to see that which occurs in the fundus of the eye, with the end that vision would be perfect." "In order to solve this difficulty he must consider:

1st. That *no one sees an image in his own eye*, because that which we have called soul is only such for a person who examines the fundus of the eye which receives the rays (as in an ox's eye), because as to that which relates to the eye of the man himself who receives the rays (that is to say, of the animal that sees) is only the reunion of a great number of impressions which are made upon the different points of the retina, which are wounded by the verticis of the points of rays which depart from the visual field; thus *the retina feels that which the man sees* (all the senses terminate in touch) and as the points of the rays which depart from the upper part of an object cannot go more than to the lower parts of the retina, after passing through the pupil, likewise those that depart from the lower parts of the object cannot go more than to the upper parts, in relation to the pupil itself. Consequently the upper part of the retina cannot perceive more than the rays which depart from the lower part of the object, etc."

For the purpose of making the preceding yet more evident the author resorts to comparisons, which are ingenuous and one of which I am tempted to relate: "Suppose that a general of an army had near to his camp a little tower located

opposite the hostile camp, and that there were no more than two avenues through which to fear attack, and that to prevent surprise sentinels had been placed in the following manner: (Fig. 1a) R is one of the two rooms contained in the little tower, and is situated on the right side. Let us suppose that the camp of the enemy is located at E and that in the room an opening or oblique window is made looking toward C, left side; L is the other room on the left side which has another window, likewise oblique, which looks in the direction \angle . The general having placed a sentinel in each of these rooms, Richard for example, who is placed in the right chamber R, when he gives a signal, does nothing but warn that he sees the enemy; from this the general judges that the enemy comes from the left side C, because although Richard is placed in the *right* chamber, he can only see what comes from the left direction —. The opposite happens to Leonard placed in the left chamber, who can only give information as to when the enemy comes from the right direction."

Now, in the fundus and cutting out the figurative language this is no more than was written almost a century and a quarter later by Girard Teulon in his notable work upon binocular vision, that is to say, *the sensorium sees not the image, sees the object* referring autocratically and primitively the origin of its sensations, not to its instrument the retina, but outside of this to the lines of space in relation to the geometric situation corresponding to the elements touched by the retina." In its place this which is known by the name of *principle of exteriority* or *law of projection* is accepted to-day as an undisputed fact by the most modern authors who treat of the physiology of vision.

But the most important work of Taylor, is that referring to the semi-discussion of the optic nerves, and this is elaborated with such a masterful hand (in chap. 24) that it might appear to be written at the present time. It is true that the original hypothesis belongs by right to Newton, but the wise English mathematician limited himself to enunciating it, without attempting to demonstrate it, and left, the same as the other questions, "to serve as an object of observation and experimentation to other investigators." Besides, Taylor in the chapter, which he dedicates, at the end of the work, to Bibliography, cites nothing from the Optics of New-

ton, in spite of the fact that this memorable book must have been then well known in Europe, and with great reason, to Taylor in his double quality of Oculist *In Optica Expertissimus*, according to the phrase stamped at the foot of the portrait.

As compatriot of Newton, it could have also occurred that, conceding his adventurous life, he would not have had time to undertake a similar work. He was no doubt more seduced by the triumphs and the money which he gained in his brilliant practice, than by the restful reading of material which he, perhaps, regarded as too theoretical. With his native talent so well developed, he would be pleased to look out for himself, caring little for what others said. But, even supposing that he had read Newton's Optics, and that he became inspired in the reading (as might be suspected by some paragraphs in his book) the chapter cited loses none of its merit, because in it the theory is so improved, that it is impossible to say of it more nor less. Indeed, in the said chapter, after relating the classical experiment of physiologic diplopia, he interprets it in a precise manner, admitting that when the eyes do not fix one object or another situated nearer or farther away, the impressions of each one of the eyes are transmitted by nervous fibres *which are not corresponding* (page 167) and in so much as they do not unite in the place that the optic nerves meet in the head. On the contrary, when the two eyes fix an object, the images fall upon points from whence fibres depart, which unite before reaching the common sensorium. The author in his love for similes compares it to the case of a bell, the cord of which is divided in two at its lower extremity, so that two men may ring it at the same time; the bell will ring if either of them pull it, or will do the same if both pull at once. The author concludes.* "That there is no communication or sensation between the external parts of the fundus of the globe of one eye, and the extreme parts of the fundus of the globe of the other eye, nor between the internal parts of one eye and those of the other; that solely the middle of the fundus of the globe of one eye (the fovea we call it to-day) corresponds to the fundus of the globe of the other, but there is no correspondence between the external parts of the fundus of the right globe, and the interior of the fundus of the

*Page 171 loc. cit.

left globe—thus *all the points of the left side or exterior of the fundus of the left eye correspond with all the points of the left side or interior of the right eye*—each point in one eye with each point in the other which are respectively equidistant from the optic axis and at the same side of it; the same occurs with the fibres of the right side."

Afterward he says: "The fibres of the optic nerve terminating in the left side of the fundus of the globe run in the left side of the optic nerve until they reach the point—in which they unite with those which depart from the left side of the fundus of the right eye—after which they run in a compound nerve in the left side of the cerebrum in which this nerve terminates."

As may be seen, the preceding is the same hypothesis of Newton, but explained in detail, which so far as I know was not done by the author of *Optics* himself, before the publication of Taylor;* but there is more yet and that is the graphic demonstration by a proceeding which we might call *ad absurdum* of this which could not be otherwise explained. Let us take the words of Taylor himself: "In order to see if that which I say is not a simple supposition, I shall demonstrate that there exists a correspondence between the right and left sides of the fundus of the eyes (that is to say between a x and b B, Fig. 5a reproduced in Fig. 2a). Let us suppose A B an arrow placed transversely before the eye, only one arrow will be seen as I have already noted, whether viewed with one eye or with both eyes; the image of this arrow in the right eye is in the position of x B inverted with respect to the object, and in the left eye in the position of a b also inverted with respect to the object, and finally in the same position as the right eye. If the extreme parts a in the fundus of the left eye communicate with the extreme parts B of the fundus of the right eye, and also the internal parts of b and x , we will see two arrows one at the side of the other, but, inverted one with respect to the other, because then x and B receiving the impressions of the different extremities of this arrow, and communicating, the same a and b will give a double sensation of this arrow; but, granting that we see no more than one arrow instead of two, it is necessary that the point a of the left eye communicate with

*According to Mackenzie, Vater and Heinicke, in 1723, had explained by the hypothesis of Newton, several cases of hemiopia.

the extreme point x of the right eye and the internal point b of the right eye with the external point B of the left eye, and by this means when we see the arrows (or other object) with the two eyes, the arrow is not seen double, but, its sensation will be only stronger."

Now; what is this but the exposition *clear and conclusive* of the theory of the identical and corresponding points, which are attributed to Johannes Müller, who, as is well known, did not publish his great treatise on physiology until 1838, that is to say exactly a century after the publication of Taylor's *Mechanism*.

And as regards the rational demonstration cited, there is no other conclusion than the existence of the chiasmatic semi-decussation because without this, diplopia would follow. What is this but an anticipation of what has been so recently demonstrated by Cajal in his notable work upon the chiasm, already quoted therein availing himself of a scheme fundamentally identical with that of Taylor, and employing analogous reasons to reach the same conclusions, which could not be otherwise, since the contrary would always have as a consequence diplopia.

I hasten to add that Cajal, to whom I have shown Taylor's book, had no knowledge of it; but, even if he knew of it, this would not diminish in the least the surpassing merit of the work of our noted histologist because the theory of the chiasmatic inter-decussation, so admirably developed and amplified with proper reasons, is there at least, being in exchange the starting point of an ingenious and original theory as to the inter-decussation of the nervous paths in general (accepted afterward with enthusiasm, by the most eminent neurologists of the world). And this constitutes the principal merit of the work quoted in the speculative as well as in the practical order.

In one point in the demonstration of the total crossing of the optic fibres of the inferior vertebrates, and the existence of the direct fasciculus in man and approximate animals, and in the others, the discovery of the existence of bifurcated fibres, (admitted as proven later by Kölliker) which redeems a very important treatise by explaining the functional relations between the two eyes.

In conclusion: In the work of Taylor, as it refers to the theory of vision, there are things well worth being held in ac-

count, we having committed a true forgetfulness which should be repaired, and if history has to be impartial with it, to point out its defects and its faults of originality in express matters, it is just also, that its merits should be recognized as to the exact ideas of its author as well as his general predictions.

I must confess that it would be a pleasure for me to have contributed to the last, with the present historic note, without in the least excusing the charlatan methods which he utilized in his practice. Unhappily these have been common in all epochs and in all places, and are unbecoming in true men of science and in all those who wish to practice with dignity the honorable medical profession.

ABOUT TREPHINING OF THE SCLERA IN PAINFUL BLINDNESS FROM GLAUCOMA.*

BY PROF. DR. KONRAD FROHLICH.

BERLIN.

TRANSLATED FROM THE GERMAN BY

DR. WALDEMAR E. FISCHER, OF ST. LOUIS.

The operations for supplanting enucleation in painful attacks of blind glaucomatous eyes have not found a wide circle of admirers.

A. von Graefe considered blind hydrophthalmic eyes and those in the last stages of glaucoma adapted for the production of a suppurative chorioiditis by means of a thread drawn through the envelopes of the globe if the organ had become the source of intolerable pains. The ultimate object was an avoidance of enucleation and the production of shrinking of the eyeball. Despite his warm recommendations the great scientist remained alone on this path which has been designated as unsafe, painful and tedious by Schmidt-Rimpler.

Also neurotomy optico-ciliaris principally recommended by Schoeler, Schweigger and Boucheron found few friends on account of the existing prejudice, although the authors were successful in arresting both pain and inflammation without any diminution in the size of the globes.

The scleral trephining advanced by Robertson for certain forms of glaucoma met with the same fate. He employed it when an iridectomy could not possibly be performed on technical grounds, and excised a small piece of sclera with a special instrument at the posterior termination of the ciliary body to remove a little of the vitreous. The permanent diminution of intraocular tension was attributed to the formation of a filtering scar less compact than the scleral tissue itself.

The few authors who expressed an opinion on this procedure are unanimous in condemning it. According to Czermak this operation offers very few satisfactory results, whence it

(*Klinische Monatsblatt für Angenheilkunde, May, 1904)

is no longer practice today. Terrien is of the same opinion, and Panas places the scleral trepanation under the same category with paracentesis and sclerotomy as far as its inefficiency is concerned.

In opposition to this, Blanco at the International Congress in Madrid, emphasized the efficiency of an extirpation of a piece of sclera. All amaurotic eyes that are painful as a consequence of hypertonia, are treated by this author by means of an excision of a small round opening out of the envelopes of the eyeball.

If especially French authors (Parinaud, Masselon, Galewowski and Terson) have succeeded in producing a filtration scar and consequently a diminution in intraocular tension in absolute glaucoma, or in hemorrhagic glaucoma, by means of the simple posterior sclerotomy made in a transverse direction or in form of a T-shaped incision, there is no reason why an excision of a disc of sclera 5 mm. in diameter should not yield just as favorable or even better results, in so far as an extensive hole-like solution in continuity would offer poorer chances for reunion of the wound margins than a simple transverse incision, whose tendency to gape leads to a broad valve-like scar which we aim to avoid in the extraction of cysticerci and iron fragments.

These considerations have affirmed themselves in practice. During the last two years I accomplished a reduction in tension to normal or subnormal of glaucomatous eyes as hard as stone four times in five cases, rid them entirely of inflammatory symptoms and have succeeded in permanently relieving the excruciating pains.

Technique of the operation: A conjunctival flap is formed. An incision from 10 to 12 mm. in length is made along the lower border of the external rectus muscle and a similar one corresponding to the external border of the inferior rectus muscle. The remaining conjunctiva intervening between the beginnings of both incisions near the limbus is severed; the flap is dissected off the sclera as clean as possible and is turned back toward the equator. The scleral disc is then excised with a trephine just behind the ciliary body and the conjunctival flap is replaced and held in its original position by several conjunctival sutures.

Von Hippel's trephine with the 5 mm. crown is used. The instrument works faultlessly and has the advantage that the

cutting portion of the trephine can be adjusted with absolute accuracy to the fraction of a millimetre so that the sclera only is cut through, without injury to the remaining ocular membranes. To cut them is not only unnecessary, as the vitreous on account of the sudden solution in continuity of the sclera, owing to its high tension, will perforate the delicate membrane, but because hemorrhage into the vitreous cavity is dangerous.

The researches of von Graefe and Schweigger have apprised us of the fact that the choriocapillaris is hypertrophic in eyes with advanced glaucoma. Should the expected rupture of the two inner membranes by the vitreous be insufficient we can puncture them with a cataract knife, a procedure that would be more conservative than making a rotating circular incision into all the respective ocular membranes. The trephine must not be placed on the sclera too firmly, as it will not rotate on account of the unyielding nature of the tense sphere. By utilizing sufficient anesthesia the procedure may be made almost painless.

An affection of the vitreous which is dreaded as a probable complication by Santos Fernandez is not likely to occur under the proper observance of aseptic measures. The scleral opening is well protected, as it does not come in contact with the margins of the conjunctival flap which far overlaps it.

The cases healed in ten to fourteen days without any complications whatever, under a simple bandage, which was exchanged for a celluloid shell after the fourth day.

CASE I.—Miss S., aet. 52, states that several years ago her right eye became affected with glaucoma. The usual operative measures were useless. The eye was removed on account of constant pains. A year ago the same catastrophe happened to the left eye. Also on this side the operative treatment was not crowned by success. Since some time the patient is annoyed day and night by boring pains. She earnestly seeks aid, but she cannot consent to a removal of the second eye as the thought of having two empty orbits is too terrible for her.

Status 25/VI, 1902: Intense ciliary injection: cornea very cloudy, dotted, nearly anesthetic. Broad colobomas upward: iris irregular and nearly maximally dilated, Tn + 3. Projection and light sense absent.

26/VI. Trepanatio sclerae. Immediately after the excis-

ion the vitreous abundantly prolapses. Bulbus slightly collapsed. Cornea clear. Bandage.

27/VI. Eye free from pain. Bandage allowed to remain for several days.

3/VII. Cornea clear, T —. No pain.

8. The patient's further progress was favorable. Patient was discharged on the 16th of July. Bulbus was painless, tension subnormal, still injected. Cocain instillations were ordered. In the fall of 1903, that is 1 1-2 years after the operation, my colleague, Kertzsch, kindly informed me that the globe has slightly shrunk and remains soft with moderate ciliary injection, and on the 20th Nov., 1903, I received a communication that the results of the operation remained successful, that there was lacrimation during the first quarter year, but the eye is now entirely free from irritation and pain.

CASE II.—H. E., aet. 78. The right eye gradually became blind thirty years ago. The eye remained pale until a few months ago, since which he suffers from uninterrupted pain in the forehead and temple, also boring pains in the eye. A course of treatment with red drops was unsuccessful.

Status 15/VII, 1903: Moderate circumcorneal injection, greatly dilated bluish episcleral veins. The corneal epithelium is thickened in places. The anterior chamber has a normal depth; the pupil is slightly dilated and does not respond to light. Bulbus as hard as stone, not enlarged. No perception of light.

16/VII: Trepanatio sclerae. The escaping vitreous has a normal consistency. Cornea collapsed. Bandage, that is allowed to remain on account of lack of pain until 20/VII.

20/VII: Bulbus filled. Cornea reflects light. No vitreous visible in the conjunctival sac. Reaction very moderate. In the further course of recovery there is nothing worthy of mention.

17/IX: Bulbus entirely pale, a little smaller. Distinct hypotonia. No spontaneous or pressure pains, anterior chamber clear. The seat of the trephining is slightly depressed and has an oval form. In some places black pigment is visible under the conjunctiva incorporated in the scleral scar. Discharged as cured.

CASE III.—Miss S., aet. 51. Was successfully iridectomized on 2/IX, 1902, by me for acute glaucoma of the right eye.

Ophthalmoscopic findings negative. Vision nearly one-half.

8/IX, 1903. Cornea hazy; dotted. One half of the anterior chamber filled with blood. Pronounced pericorneal injection; Tn + 3; perception of light uncertain. Patient refuses any operative interference. Cataplasms and morphine have no perceptible influence on the boring pains. Since her general condition is not all that could be desired, she decides on being operated upon, with the exception of enucleation.

16/IX, 1903. Trephining of the sclera. The disc remains attached by a few bands which are severed by a pair of scissors. Moderate amount of vitreous escapes. Tension distinctly reduced. Cornea clear. Bandage.

20/IX. No pain. Bandage not changed.

21/IX. Bulbus injected. Subnormal tension. Hyphemia. Cornea reflects light.

25/IX. Status idem.

10/X. Slight pericorneal injection. Cornea clear. T—. Hyphemia. No pain.

4/XI. Bulbus pale, only the pit left by the trephining is locally reddened and has a bluish appearance as seen through the conjunctiva.

10/I, 1904. Bulbus paler, softer, nonsensitive eyeball with transparent cornea. Traces of the hyphemia still present.

15/II. Status idem. Light sense very uncertain. Very slight reflex with the ophthalmoscope. Discharged as cured.

CASE IV.—G. F., aet. 48, received an injury to his right eye ten years ago. Since four weeks there exist severe pains in the eyeball which radiate toward the forehead and temple.

Status 15/I. 1904. Bulbus is of normal size. Pronounced injection. Very hard. Old maculae corneae. Anterior chamber shallow. Lens capsule thickened. Perception of light is absent.

16/I. Trepanatio sclerae. Vitreous of normal consistency escapes. Bulbus does not collapse. No hemorrhage. Bandage does not require to be changed on account of absence of pain.

20/I. Hypotonia. Moderate injection. No pain. Nothing abnormal in the further course of healing.

20/I. Bulbus gets paler, appears a little smaller. No pain. Tn —.

2/II. Bulbus nearly free from injection. The region of the trephined area is still reddened. Conjunctiva is united to it and has radiating appearance.

16/II. Status idem. Tension distinctly subnormal. No pain. Anterior chamber shallow. Discharged as cured.

CASE V.—Mrs. C., aet. 66. Fourteen years ago the right eye gradually became blind without any inflammatory symptoms. About six weeks ago it commenced to pain with increased lacrimation. The pains became more severe and are equally severe during the day or night.

Status 7/XI, 1903. Bulbus is enlarged in all diameters. Very hard. Dilated bluish episcleral veins. Corneal epithelium slightly thickened. Anterior chamber absent. Iris apparently atrophic. Several posterior synechiae. Corneo-scleral margin indistinct.

8/XI. Trephining. To insure an abundant escape of vitreous the trephine was adjusted to a cut to depth of 2 mm. Immediately after the three bulbar membranes were cut, there was an extensive hemorrhage from the wound which it took sometime to control with cocain sponges. Vitreous loss slight. Tension not reduced. Pains continue. Tn + 3. Cataplasms are of no benefit whence an evisceration was performed on 13/XI. The vitreous is removed as a bloody clot. Recovery.

From the above mentioned brief recapitulation of the case histories, it follows that in four cases, (one irritative, one hemorrhagic and two secondary glaucomas) absolutely favorable results were achieved. The tension was reduced below normal, the inflammatory manifestations had entirely or nearly subsided and the pains had ceased. The original round scleral wound had assumed a more oval form during the process of scar formation and was depressed with or without an incorporation of the conjunctiva. The development of a staphyloma, as has been observed by Vacher after posterior sclerotomy, could not be demonstrated.

The failure in the fifth case I have probably caused myself by accidentally pushing the trephine through all the ocular membranes, whereby a profuse hemorrhage resulted, which was not only extrabulbar but took place into the vitreous as well, as the evisceration later proved. It is also possible

that ectatic bulbi of this character are not adapted for trephining on account of the danger of excessive hemorrhages.

If boring into the sclera is effective in removing the source of unbearable pains and to establish a normal or subnormal tension in bulbi in the last degenerative stages of glaucoma, this procedure deserves the preference over a removal of the disease by the short and radical performance of enucleation.

Of course, under certain external conditions, when we are dealing with patients that have come considerable distances and whose health has been shattered by suffering weeks of agonising pains, who prefer to return to their homes as soon as possible and furthermore make no demands on cosmetic appearances, one would at once obey the demands of necessity and decide on the performance of an enucleation. But if the patient's circumstances are more favorable, we can follow the conservative principles of surgery; the more so as trephining is nearly painless, is rapidly performed and does not require the administration of a general anesthetic. In this respect the operation is superior to a resection of the optic nerve, which is a severer form of surgical interference.

The principle of eradicating a disease with the preservation of an organ is one of the noblest achievements of modern surgery; even if Schmidt-Rimpler pronounces enucleation the surest means for checking the pains, we still should not be over ready to perform this ugly operation. Bardeleben said regarding amputation, "an operator should barely exist who likes to amputate; it is an operation forced on us by necessity, which can not yield the pleasure of true and complete aid to either sufferer or operator." The same is true for enucleation.

Should the trephining prove a failure, enucleation will be indicated for the rapid removal of the disease. The same object is accomplished by evisceration, which, when judiciously performed, has the great advantage of affording the prosthesis greater motility, besides representing a less severe surgical interference.

On the grounds of numerous experiences I can recommend the following method: One severs the tendons of the four recti muscles, they not only move the eyeball laterally but also exert an influence of retraction on it, a portion of the latter function will be lost when they have been cut.

The bulbus will consequently protrude forward a little more. After this the cornea is divided with a Beer knife straight through the horizontal meridian. One wound-margin is grasped with a toothed pincette and raised; a large surgical curette is next introduced into the scleral sac, through the gaping wound in order to free it entirely of its contents. Finally, the scleral sac is thoroughly cleansed with an antiseptic solution and is then tamponed with cotton or gauze until it has resumed its original spherical form. The tamponing has a twofold advantage: In the first place postoperative hemorrhages, which are dreaded in staphylocomatous or hydrophthalmic eyes, are prevented; and, secondly, the divided muscles are crowded backward so that their tendons heal to the sclera more posteriorly, and thereby the advantage of the prominent bulbus is assured.

A light compress bandage may be left in place for several days; then the tampon is removed after it has been loosened by sufficient moistening. With a little patience this manœuvre may be executed with little inconvenience to the patient.

The cornea gradually assumes a gray tint but will not necrose; its cut surfaces will reunite with each other with more or less pronounced retraction. Finally the anterior surface looks dimpled, but offers the prosthesis such broad contact surfaces that its motion leaves nothing to be desired.

In some cases chemosis manifests itself. The edematous conjunctiva may protrude from the palpebral fissure, an entirely harmless occurrence which causes the patient no inconvenience and will recede with or without hot applications or scarification. On an average of three weeks a prosthesis may be inserted.

I have performed this method of evisceration in place of enucleation in violent panophthalmitis, in total staphylocomata of the cornea, in painful phthisis bulbi and also in recent and severe traumas. In the last-mentioned group I utilise the opening made by the perforation, whether it be in the cornea or sclera, for the introduction of the sharp spoon. A sequestration of the sclera or a suppuration of the same I could not observe.

The above cases have been reported in order to demonstrate that it is not absolutely necessary to enucleate in painful cases of glaucoma, but that if conditions are favorable we may proceed by substituting a more conservative

operation. The number of cases cited is only small and does not entitle me to recommend it unconditionally, but it has taught me that trephining of the sclera is better than its reputation and that the unfavorable criticism of most authors is unjust.

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AMBLYOPIA FROM DISEASE OF THE OPTIC NERVE
(RETROBULBAR NEURITIS). ITS TREAT
MENT BY HYPODERMIC INJECT-
IONS OF STRYCHNIA.*

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When Albrecht Nagel first published the results of his treatment of atrophy of the optic nerve by hypodermic injections of strychnia, the subject received very general consideration from the profession throughout the world, but confidence in the value of the drug for this condition gradually seemed to be somewhat impaired, and to say the least, there has not been as much activity in prescribing strychnia for disease of the optic nerve of late. A new interest was excited in this country by the writings of Dr. Hasket Derby, who never has lost faith in the value of hypodermic injection of strychnia in certain forms of disease of the optic nerve. Somewhat induced by Dr. Derby's unqualified approval of Nagel's methods, and his statement that he had continued them, although I did not take up the matter entirely anew—for I have constantly used this treatment more or less—at my hands it has received a new impetus and I have been more careful not to exclude any case offering any proper indications for the treatment by use of strychnia, from being fairly considered. The cases which are now presented have, with a few exceptions, been treated in the Post-Graduate Hospital, either in the private rooms or in the wards. The exceptions were cared for by the family physician and the patients were as thoroughly managed as if they had been under hospital care. I think the results of the treatment and observation of these cases, are sufficiently important to form a contribution of some value to those who are interested in this department of work. I have also had my attention directed to the internal use of strychnia in large doses in cases of atrophy of

*The Post-Graduate, July, 1904.

not have recovered without strychnia, by simply abstaining as he did from alcohol. I lean, however, to the belief that the strychnia contributed essentially to his cure. The tobacco probably had no part in causing the disease, for he recovered while still using it. He took iron also for most of the time during the treatment. It was the alcohol that was impairing his nutrition and when that was stopped, and the waste of his tissue made up in proper food, it seems quite possible to me that without strychnia his recovery would have occurred, but this must remain somewhat a matter of opinion, and this must also depend somewhat on the state of mind of those having charge of the patient and their views as regards the efficacy of the drug.

CASE II.—I here insert as a coincidence but as a matter of interest, the case of a younger brother of this patient, aged 12. He was a healthy boy, except rather over stout and lethargic for his years, who was brought to me by his mother on December 29, 1902, with the statement that he had not been able to see well at school of late. His vision of the right eye was 20/50, the left 20/50, he had no astigmatism that needed correction. This boy was certainly not an alcoholic or nicotine subject. His optic papillae showed no trace of this, neither did his visual fields. The question of malingering was gone very carefully into, and from our observations we were quite decided that there was nothing of the kind. He could read only No. 2 Jaeger, and evidently it hurt him to read. The boy was taken from school and placed under the use of hypodermic injections of strychnia. The highest dose reached, which is certainly very high, was $1/2$ a grain, and on the 13th of March he was discharged, cured.

CASE III.—*Toxic amblyopia, tobacco and alcohol. Improvement.* E. D. L., aged 38; a driver by occupation, was admitted to the Post-Graduate Hospital on the 8th of May, 1903. He had been addicted to the excessive use of tobacco from boyhood and whiskey for two years. Four months ago his sight began to fail. His right vision was 6/200 and the left 4/200. There was no refractive error. The right optic papilla was white in the center, no vertical vessels were left within the same. The field was good. There was a central scotoma for red. This young man was treated in the Hospital from the 14th of May, 1903, to the 24th of June, 1903. He then returned

to his home in Watertown, N. Y. The dose of strychnia reached in the Hospital was $1/2$ grain, that is to say 31/60. This dose was varied from time to time according to the reaction. He then left the Hospital and came to my office on October 10th of the same year, the scotoma having disappeared and his vision being 10/200 in the right eye and 8/200 in the left. In other words, his visual power was nearly double, but it had not reached a point enabling him to carry on any business or to read. In making the test for scotoma for red, it was observed that the spot looked blurred as it approached the macula, and the red changed color to a light pink. If this patient had been willing to remain under treatment, I thought that he might improve still further, and I am not without hope that if he continues to abstain from alcohol he may still further increase his vision, for at one time his vision in the right eye was 20/200 and in the left 19/200, as decided by Professor Irwin in my clinic. It has always been a matter of interest to me that patients are sometimes not as eager as are their attending physicians to recover their sight. At any rate, I was unable to persuade this patient to stay longer in the hospital or to return to it.

CASE IV.—*Toxic amblyopia from alcohol. Improvement.*

D. O. D., age 31; a porter; Irish, He was admitted to the Hospital on the 23d of January, 1903, on account of poor sight. He states that he has always been a pretty hard drinker and he first noticed trouble with his eyes about two years ago. Things looked misty and objects seemed to dance before his eyes. Has no pain in his eyes but has slight pain in the back of his head. The case was diagnosticated as one of toxic amblyopia from alcohol. He was under my care in the Hospital and afterward he made daily visits to the Dispensary. His nutrition was carefully attended to. The highest dose of strychnia that was reached was 31/60, or a little more than half a grain. He finally gave up the treatment, his vision being then in the right eye 20/200 and in the left eye 20/200. His highest dose was little more than half a grain of strychnia. There is no note as to the scotoma for red.

CASE V.—*Toxic Amblyopia. No improvement.* August S., age 27; a sailor by occupation, born in Finland, was admitted to the Hospital on account of impaired sight. He has had difficulty in seeing or the past four months. He states that he first had a pain in his back and shoulder and

then in the back of his head. He was a hard drinker until four months ago; since then he has been temperate, according to his statements, and uses a moderate amount of tobacco. His vision in the right eye was 20/200, the left 20/200. There was an opacity of the cornea on the periphery which did not effect his sight. He had a high degree of astigmatism against the rule on the right side, three diopters, and one diopter on the left. This being corrected, his vision became 20/100 in each eye. The retina did not look sound in this case. It had a granular appearance. There was nothing marked about the optic papillae, and I have always been in doubt as to whether it was a true case of toxic amblyopia. He received no benefit from the treatment, and he was discharged at his own request on the 4th of May. The dose reached in his case was 35/60.

CASE VI.—*Amblyopia from excessive use of tobacco and from diabetes. Improvement under the use of strychnia and anti-diabetic diet.* January 27, 1904. L. O. R., age 57; a merchant. He first came to my office. Was transferred in two or three days to the Post-Graduate Hospital where he stayed four weeks. The object in sending him to the Hospital was to see that his diet and abstinence from tobacco could be controlled. Mr. R. said that his sight had been failing for some months. He admitted that he smoked ten cigars a day. Vision of the right eye was 20/200, left 8/200. His refraction was astigmatic, requiring corrective glasses for reading. With these he could read No. 5 Jaeger with some difficulty. There was a central scotoma for red. This patient showed a percentage of sugar in his urine on admission which decreased considerably after treatment and finally increased, probably because the diet was not observed, as the patient seemed very unwilling to carry out the treatment as directed. In spite of all that, after ridding his system of an enormous quantity of drugs which he was administering to himself, after the manner of those patients conducting self-treatment, which formed the basis of a recent leading article in the London *Lancet*, he was put upon the hypodermic injection of strychnia until the dose one-half grain was reached. It never caused any toxic sensation whatever, although the patient was observed very carefully by the House Surgeon with reference to this point. He finally considered the remedy too exciting and he left the Hospital and my care. His vis-

ion had become 20/50 in the right and 20/200 in the left.

CASE VII.—*Toxic amblyopia. Excessive use of tobacco. Improvement after six months' treatment, which is being continued.* J. L., 51 years of age, consulted me at my office. He is a contractor by occupation. This patient was a man in very large affairs, which had been very exciting and irritating on account of the frequency of strikes and his inability always to carry out his contracts. He admits that he smokes ten cigars a day. He drinks no intoxicating liquors. A person who admit to ten cigars a day usually smokes many more. It is a remarkable thing in clinical experience in these diseases that it is with reluctance that patients admit exactly what their habits are. I always find it exceedingly difficult to get the exact truth on this point. This patient's vision was in the right eye 20/100, left 20/70. After four months' treatment under the care of an excellent physician in Brooklyn, a treatment somewhat irregular but tolerably persistent, the patient on the 19th of April, had a vision of right, 90/100, left 20/40. At one time his vision in the right eye was equal to 20/70. Although an attempt is made to make the illumination always the same in testing the vision it is not satisfactorily secured in my office, since the patient sits with his back to a large window facing the test types illuminated by electric light. On a very bright clear day the vision is a shade better than on dark days. When the patient entered on this treatment he could only read No. 4 Jaeger, but now his distant vision has improved to such a degree as to effect his near reading and he is able to read No. 1 Jaeger.

CASE VIII.—*Amblyopia from alcohol. Improvement after a month's treatment.* V. O., age 44; bartender. Says he drinks about a quart of beer a day. He probably drinks much more, two gallons would be nearer the amount. He says he smokes four or six cigars a day. This he has done for twenty years. He has gradually been losing his sight for six months. There is marked scotoma for red. His vision is 15/200 in the right eye and 15/100 in the left. There is nothing abnormal about his refraction. Although there was no evidence of specific disease he was put under the mixed treatment and the use of strychnia internally. On May 23, he had reached 2/5 of a grain, the doses being divided during the day in 1/30 gr. each. On May 29, the date of his last appearance, his vision

was 15/50 in the right eye, and the same in the left, when the eyes were used together 15/40. By the ophthalmoscope there were no diseased appearances.

This case indicates that with total abstinence from the toxic agents, which it was perfectly evident this patient had practiced, the strychnia could be given internally with equal benefit as when given hypodermically. This is in accordance with Dr. Graeme M. Hammond's experience. The patient presents a most favorable appearance, the patient's color becoming better, his weight increased and he stated that his appetite is now very good, whereas when drinking and smoking excessively he ate very little. The general improvement and the subjective increase in vision was very marked. He thought he could see very much better than he really could, probably because such vision as he had was perfectly clear. He finally admitted to having been a very heavy drinker.

CASE IX.—*Atrophy of optic nerves. Process at a standstill fourteen months after treatment by strychnia administered by the mouth.* Mrs. H. C., aged 45, April 17, 1904. The patient, a lady states that of late she has had poor sight, and that for a number of years she has been a nervous subject, having twitching of the face, flushings, etc. Her vision is right, 20/40, left, 20/40. She reads No. 3 Jaeger with great difficulty. Both optic papillae are white; the vessels are well filled. Her visual fields are symmetrically decreased in size. There is no scotoma. She has been under Dr. Hammond's care since she first consulted me. My diagnosis was atrophy of the optic nerve, probably of spinal origin. Dr. Hammond, however, thought it a case of neuritic atrophy. The patient has been taking strychnia internally since her first visit to me. Dr. Hammond informs me that she takes $\frac{9}{16}$ grain 3 times a day internally and that her vision remains exactly the same. In one other case of atrophy, occurring in a young girl of about 20, whom I referred to Dr. Hammond's clinic, in the Post-Graduate, after six months of treatment by strychnia internally, the vision ceased to diminish. She reached doses of $\frac{1}{2}$ grain by mouth three times a day. The maximum dose that Dr. Hammond has ever reached hypodermically is $\frac{4}{5}$ of a grain and $\frac{3}{4}$ of a grain by the mouth three times a day.

It will be observed that only two absolute cures are here reported. One of these was a case of toxic amblyopia, the other that of his brother, the young boy. In regard to the latter, it may belong to the category of cases of neuritis caused by continued accommodative strain such as reported by myself, in the *Medical Record*, February 20, 1904.

**ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.**

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**On Removal of the Crystalline Lens in High Degrees of
Myopia, as Illustrated in Sixty Cases.**

SNELL, SIMEON, Sheffield, Eng. (*The British Medical Journal*, Feb. 27, 1904.) The writer narrates the experience gained in this operation in 60 cases of high myopia. He believes that within defined limits, removal of the lens for high degree of myopia may now be regarded as a recognized and valuable method of treatment. Seventeen patients were less than 20 years of age, 18 between 20 and 30, four between 30 and 37, and one was aged 48. If the operation be limited, as he believes it usually should be, to myopia of 14 D. and upward, the total number of suitable cases must always be a comparatively small one. In 3162 consecutive myopic patients (6324 eyes) in the writer's private practice, there were 320 in which the degree was more than 10 D. or a trifle

over 5 per cent ; if the calculation had been made at a higher degree of myopia, which, strictly speaking, it should have been, the total number of instances suitable for operation would be decidedly less.

"Extraction was deemed unsuitable, and in no instance has it been adopted. In each case the transparent lens has been needled, and at the end of a week, sometimes more or less, when the lens substance has become sufficiently broken up, an incision with a broad needle has been made a little distance inside the periphery of the cornea, and the softened lens has been allowed to escape, or has been coaxed out with the aid of a curette. The pupil has previously been dilated with atropine, and by keeping the situation of the corneal wound inside the limit to which it dilates, the danger of entanglement of the iris in the wound is materially lessened. This operation is similar, of course, to that frequently performed for zonular and other forms of cataract. In all cases a watch must be kept for increased tension, which is liable occasionally to be set up by the swelling of the lens. In a few of my cases glaucoma has in this way supervened. Removal of the broken-up lens was, however, promptly performed, and was followed by immediate subsidence of the pain and sickness, and with excellent visual results.

When operating, endeavor is, of course, made to remove as much of the softened lens matter as will escape without undue pressure on the globe. What remains, however, will undergo absorption, but a further needling will be required. Needling may also be necessary for an opaque capsule and it is therefore important to bear in mind that treatment in some cases may be somewhat prolonged. In one of my early instances I was perhaps hardly alive to the importance of this and operated rather against time, as the patient was leaving England.

If due regard be paid to asepsis and the use of sublimate or some other antiseptic solution, which are essential to eye operations, the dangers attendant on this operation are trifling. The introduction of any suction apparatus is altogether unnecessary, for by gentle coaxing the softened lens matter readily comes away through the corneal wound. It is desirable, however, that after the needling operation the patient be kept under close observation, for, as mention has already been made, in some instances the swollen lens is

apt to induce increased tension as signified by pain and sickness, and the immediate performance of the second operation for the removal of the broken-up lens will be indicated. A free opening of the capsule is practised, because it is held that by permitting the broken-up lens to escape into the anterior chamber, increased tension is less likely to be induced. This is not, however, the only period that it is necessary to be on one's guard against the onset of increased tension.

In a certain number of cases after the usual operative measures have been completed and the pupil is free, or nearly so, of lens matter, increased tension may occur. In these instances atropine has very promptly been used to maintain a dilated pupil whilst the remnants of the lens were undergoing absorption. The atropine may be discontinued and eserine substituted, but it will, in my experience, fail frequently to overcome the glaucomatous condition. The best plan is to tap the anterior chamber, and to repeat if necessary the paracentesis. In the few instances in which increased tension has arisen in the circumstances just now mentioned, paracentesis has acted well, and the results in those cases have been among my best.

The operation performed in many cases is similar to that practised for lamellar cataract, and the dangers are the same. A bead of vitreous may present at the wound, but this should very rarely occur if care has been taken to limit the tearing of the capsule to the anterior capsule, which should readily be done, and also if too great pressure on the globe is avoided when the lens is coaxed out by the curette.

My practice has been to indicate to a patient the advantages which may be gained by operative measures, but at the same time to point out that to achieve the benefits, he or she must be prepared to face the risks which, however, are not great. The decision is left to the patient.

Some authors have alluded to the danger of detachment of the retina resulting from removal of the crystalline lens for high degree of myopia. I have no experience of extraction of the lens in these cases; I cannot therefore say whether it is a danger by that method or not. All my cases have been treated in the manner I have described, and certainly detachment of retina is not a danger of moment in my experience. I recollect of only two instances."

C. H. M.

The Association of Cataract With Uncinariasis or Hook-Worm Disease.

CALHOUN, A. W., Atlanta, Ga. (*Ophthalmic Record*, April, 1904), gives the clinical histories of a number of cases of cataract occurring during the course of the hook-worm disease and where the opacity of the lens began after the establishment of the general disease.

The author believes the development of the cataract is due to the disturbance in nutrition of the lens, dependent upon the impoverished condition of the blood which is present in cases of uncinariasis and adds that if this disease predisposes the patient to cataract, the hook-worm becomes a subject of as much interest to the ophthalmologist as to the general practitioner, for in the victim of uncinariasis, cataract might become one of the preventable diseases, since it, (hook-worm disease) is so rapidly and surely curable. W. R. M.

Extraction of Bullet, Located by Roentgen Rays, From the Orbit.

HANSELL, HOWARD T., M. D. (*American Medicine*, April 30, 1904.) The bullet passed through the temporal muscle and temporal bone of the right side. The patient was not unconscious. Two weeks afterward the author found a small blue colored indentation of skin 1 1-4 in. posterior to the bony margin of the orbit and on a line horizontal with the center. There was complete paralysis of the third nerve, and total loss of vision. No impairment of cerebral faculties and no general paralysis. The eyeball was directed down and out and almost completely immobile, deeply injected, tender; and no view of the fundus could be obtained on account of hemorrhage into vitreous.

The radiograph demonstrated the bullet between the posterior part of ball and inner wall of orbit. An incision was made through the upper lid and the posterior tissues between the eye and the roof of the orbit divided, making a wound large enough for the little finger, until the bullet was reached. The hemorrhage was insignificant because the vessels were avoided. Bullet was found and removed with forceps. Iodoform gauze was inserted for 24 hours and then the edges of lid incision sutured. The wound healed and patient was discharged on the third day.

Several weeks later eye had regained much mobility and lid drooping was less and injection and pain subsided.

M. D. S.

The Use of Mucous Membrane From Frog's Mouth for Grafting in a Case of Symblepharon.

PATON, LESLIE, London. (*The Lancet*, April 23, 1904.)
The writer operated upon an eye in which there was complete attachment of the lower lid to the eyeball causing limitation of movement and diplopia in every direction so that the fellow eye had to be covered constantly. He used membrane from the roof of the frog's mouth to form a re-lining of the lower conjunctival sac.

"Three frogs were used and from these, three flaps were prepared, the largest being about two centimetres in breadth; the other two, from smaller frogs, were approximately the same breadth but shorter. These were kept in warm sterilized saline solution while the eye was prepared. In dissecting the surface, care was taken to leave any normal conjunctiva attached to the ocular surface. The dissection was carried down until over a centimetre of raw palpebral surface was exposed. To this the larger piece of mucous membrane was attached by four fine silk sutures along the upper margin, the lower margin being left unattached. The other two pieces of mucous membrane were similarly sewn to the fringe of conjunctiva on the ocular surface. They were carefully arranged in position and a piece of green protective was pushed in and the eye was closed and bandaged. On the sixth day the protective was taken out and the stitches were removed. All three grafts had taken, the palpebral one and the outer ocular one perfectly, the inner ocular one not quite so well, and at the line of its suture there was a fleshy granulation. The movements of the eye were now free except that on extreme movement outward there was some diplopia.

At the time of writing (March, 1904), the appearance of the eye is almost natural. There is an irregularity of the lower lid margin which, however, is not marked. On pulling down the lower lid at the inner margin there is one cicatricial band passing to the eye about a centimetre in length and about three millimetres in breadth. In the rest of its extent the conjunctival sac is almost normal in appearance. The cica-

tricial band limits the outward movement of the right eye to some extent and I propose to do a further slight operation to free that. I believe that frog's skin has been used frequently for skin grafting. The above case shows that where extensive mucous membrane grafts are required the readily available frog can be brought in to spare the mucous membrane of the patient's own mouth." C. H. M.

Rubber-Dam Dressing After Enucleation.

CULBERTSON, L. R., Zanesville, Ohio. (*The American Journal of Ophthalmology*, April, 1904.) "The removal of the first dressing after enucleation, when gauze is used, is nearly always very painful, and anything that prevents this is a great boon to such patients. Even when the gauze strips are saturated with vaseline, they will stick and cause pain in removing. Recently in reading of McKernon's method of spreading rubber dam over the surface of the wound after a mastoid operation to prevent adhesion of gauze at the first dressing, I thought how useful it would be after enucleation. At the first opportunity I tried it and it was a great success. A piece of medium weight rubber dam was cut round. Then I cut several very small holes in it from $1/16$ to $1/8$ inch in diameter (these to go in the back of the cavity) so as to allow any blood or pus to flow through and get on the gauze. The dam was then pushed back in the cavity and the iodoform gauze was pushed in upon it, filling up the cavity.

The dam should be large enough to cover the conjunctiva of the lids. Before putting in the dam all hemorrhage should be arrested with hot water or adrenalin (1—5000). Before the operation the dam should stand for an hour in 1—1000 corrosive sublimate solution. Just before dressing it should be rinsed in sterile water and dried in a sterile towel. It can be used at the second dressing, but the pressure used in introducing it may be painful to some. The dressing may be removed on the second or third day after the operation," C. H. M.

Ethyl Chloride as a General Anesthetic in Eye Work.

STEPHENSON, Sydney, London, and CHALDECOTT, J. H., London. (*The Ophthalmoscope*, April, 1904). Stephenson calls attention to the fact that few ophthalmic surgeons

appear as yet to realize what an extremely valuable general anesthetic they possess in ethyl chloride, an agent now widely employed in general surgery. Its advantages over the older anesthetics are: it is easy to give, anesthesia is quickly induced, its effects pass off rapidly, there is no cyanosis, vomiting is not common and seems to occur only when an overdose has been administered; no death has yet been reported in this country (one fatal case has recently been reported in America—C. H. M.) Seitz ranks ethyl chloride next to nitrous oxide in point of safety and gives the death rate as 1 in 1600 administrations.

"From an ophthalmic point of view, ethyl chloride is an almost ideal anesthetic. The writer has employed it on upward of two hundred occasions in both children and adults, and the farther his experience extends, the greater is his appreciation of the new agent."

This anesthetic is especially useful in eye-work for examinations which must often be made in out-patients departments, especially of children's eyes: in the intense photophobia accompanying eczematous keratitis of young children—here the anesthetic acts admirably, administration, examination and recovery lasting five minutes at the most. The agent is useful for ophthalmoscopic examination in refractory children. "The unruly child is simply taken into the nurse's arms, placed in a convenient position with regard to the lamp, and the anesthetic is administered. The period of insensibility is quite long enough, even with a single dose, to allow one to examine both fundi with the ophthalmoscope, and even, if necessary, to introduce a speculum, and to steady the eyeball with fixation forceps.

Another field for the employment of ethyl chloride lies in the examination of the cornea in patients suffering from gonorrheal ophthalmia. The parts are then so exquisitely painful as to render a complete investigation without a general anesthetic almost a practical impossibility. Yet it is obviously a matter of prime importance to ascertain whether the cornea is or is not ulcerated. With regard to the performance of operations under ethyl chloride, any one of the minor procedures may be undertaken. Thus, the writer has passed lachrymal probes, opened abscesses, extirpated Meibomian cysts, slit the outer canthus, "expressed" the conjunctiva, tapped the aqueous humour, cauterised corneal

ulcers, punctured the vitreous, needled the lens and so-called "secondary cataracts," and divided the recti muscles under its influence. Of the larger operations he has eviscerated and removed the eyeball under ethyl chloride anesthesia. In brief, from a purely practical standpoint, he believes the new anesthetic to be speedy, safe, and almost free from unpleasant complications, and to be eminently suited for such examinations of, or operation on, the eye as do not occupy much time. Lastly, he would emphasize the several facts that ethyl chloride is easy to give, pleasant to take, not expensive, and the apparatus is neither cumbersome nor complicated."

Chaldecott considers this anesthetic an ideal one for minor ophthalmic operations by reason of (1) its rapid induction, (2) the quiet type of anesthesia induced, (3) the ease and safety with which it may be given to patients of all ages and all types, (4) its comparative freedom from distressing after-effects, and (5) the absence of unpleasant odor in the room.

Taking for example the extirpation of a Meibomian cyst from the lid of a nervous and fractious child, the writer considers gas, gas and oxygen, or gas and ether unsuitable anesthetics for this kind of operation; until the introduction of ethyl chloride there was no alternative to the administration of chloroform. "Now, in comparing the use of chloroform and ethyl chloride for this particular class of cases, it is important to bear in mind that the induction of anesthesia by chloroform presents exactly the same dangers when given for a minor as for a major operation, and it must be given in the same way and with the same care; much time is often unnecessarily wasted, and the patient subjected to a risk which is not warranted by the short space of anesthesia which is required. In the case of ethyl chloride a single dose is administered, which will certainly within a few seconds induce the necessary anesthesia, but which is not sufficient to kill. The type of narcosis is as quiet and satisfactory in every way as that of chloroform, and after effects are either altogether absent or much more transient than those produced by chloroform. If unforeseen difficulties in the operation occur, it is easy to administer more ethyl chloride or to continue the anesthesia by means of chloroform.

The rapidity with which anesthesia can be induced with ethyl chloride is equally striking in the case of adults, even in those of powerful build and of alcoholic tendencies, and for this reason it is exceedingly useful as a preliminary to chloroform for operations of longer duration.

The dose required for the induction of anesthesia varies according to the age and type of the patient. In a young child complete anesthesia can be rapidly induced with from 2 cc. to 3cc. whereas to produce the same effect in the same time in the case of a powerful man 6 cc. to 7 cc. should be used in one dose"

C. H. M.

Pulsating Exophthalmos.

MURRAY, F. W., New York. (*Annals of Surgery*, March, 1904; Abstract from *Medical News*, April 23, 1904.) The majority of the cases of this distressing condition result from an arteriovenous aneurism of the carotid artery and cavernous sinus. A few more undoubtedly due to spontaneous aneurism of the ophthalmic artery; 71 per cent. of cases follow traumatism. Murray states that immediately following rupture of the artery, blood escapes into the sinus. The increased pressure interferes with the venous pressure through the superior ophthalmic vein and passive congestion results. The symptoms of this may develop rapidly or slowly, depending upon the opening between the artery and sinus. Characteristic symptoms are exophthalmos, pulsating tumor at the inner angle of the orbit and bruit. The protusion of the eyeball is in most cases extreme. The lids swell and become edemateous. The conjunctiva is chemotic. Its veins are distended and tortuous. Its circulation is reversed. The vein becomes practically an artery and forms a pulsating tumor above and to the inner side. Sight may be unimpaired, but it grows weaker and blindness will follow unless the lesion be removed. Subjective symptoms are marked; headache and other cerebral disturbances being the usual cause for the patients seeking relief. Compression of the carotid affords temporary relief of the symptoms. Ultimately, unless treated, these cases all go on to a loss of sight, with the exception which proves the rule, of a few which have gone on to spontaneous cure. The therapeutic measures are limited by the morphology of the parts to a simple reduction of pressure in the sinus so that passive congestion of the superior ophthalmic

mic vein may be relieved. Ligation is the operation of choice and in six weeks at the outside, cure, in successful cases, is complete by this method. It is interesting to note that the general mortality after ligation of the common carotid is probably about 25 per cent. In such ligation, however, in the case of exophthalmic patients, the mortality is not over 10 per cent. Reference to the tables of Sattler and Slomann shows that the percentage of cures were in each case about 50 per cent., the mortality being about 4 per cent. Blindness may result if the operation be done too late. In the tables referred to, the time of its inception was from four to sixteen weeks. Recurrence is more frequent in traumatic cases. Those patients who are blessed with a low grade of compensatory circulation have the highest chance for recovery. The superior thyroid artery plays an important part in this circulation, and in several cases, it was found, some weeks after the carotid ligation, to be dilated and strongly pulsating. This suggests the desirability of tying the external carotid below the origin of the superior thyroid. This delays the establishment of a collateral circulation. It may occasionally happen that both common carotids have to be tied for the cure of pulsating exophthalmos. There are six cases in all recorded, an interesting observation on them being that they were accomplished without mortality and in five cases there was either marked improvement or cure. In conclusion, the author stated that in his opinion the internal carotid should first be tied, this failing, the ligation and resection of the branches of the superior ophthalmic vein at the inner angle of the orbit should be done, and if necessary a resection of a portion of the main vein. In case of this failing, ligation of the opposite carotid should be instituted.

C. H. M.

Ligation of the Lacrimal Canal to Prevent Infection Following Cataract Extraction.

QUACKENBOSS, ALEX., (*Boston Med. & Surg. Jour.*, March 31, 1904.) "Infection through the tear duct is one of the common causes of suppuration following cataract extraction. To overcome this difficulty, various means have been employed, in cases where diseases of the tear passage exist; viz., probing, syringing out the sac, treating the nasal cavity, packing the sac with antiseptic ointment, obliteration of the

sac or canal with the cautery and extirpation of the sac. Probing, syringing out of the sac, or treatment of the nasal cavity, entails a long course of treatment, and is often ineffectual. Personally, I have had no experience with packing the lacrimal sac with antiseptic ointment. Cauterizing the duct or sac has occasionally been followed by infection. Removal of the sac is undoubtedly the safest procedure, the only objection to it, in cataract operations, is that a great many of this class of patients are old and infirm. Dr. Knapp, in Norris and Oliver's "System of Diseases of the Eye," speaks of "ligating the lachrymal canal as a temporary or permanent means of shutting off infection." At the meeting of the American Ophthalmological Society in 1902, Dr. Buller, of Montreal advised the "temporary ligation of the canaliculi, as a means of preventing wound infection in operations on the eye,"

During the past year, I have operated on two cataract cases in which there was trouble with the tear passage; I have also seen two other cases operated on. The canal was tied, and in each case was successful in preventing infection.

The report of one case will suffice to show the method employed.

CASE.—Female, age sixty-two; mucocoele, O. U. staphylococcus; pressure over lacrimal sac causes muco-purulent discharge into the eye.

The usual preparations for cataract extraction were carried out.

Operation under cocaine. Before operating for cataract, the contents of the mucocoele were squeezed out, the eye washed out with corrosive (1-5,000), then a small probe was inserted into the upper puncta, and a suture passed around the canal, from the inside of the lid out. This was repeated on the lower lid. The sutures were passed two or three mm. from the puncta and were tied quite firmly.

Inserting a probe into the puncta aids in controlling your lid and in placing your stitches; this is especially so with the upper lid. The cataract was then extracted without incident, the usual dressing was applied, the dressing was changed daily and omitted at the end of six days. Healing process normal, very little injection being present at any time following the operation.

The patient complained of no discomfort from the stitches,

and they apparently caused no irritation. The stitches were removed at the end of two weeks; before taking them out, pressure over sac failed to discharge anything into the eye, but after removal, a probe was easily passed, and pressure on the sac caused a small amount of muco-purulent matter to come through the puncta.

I see no reason to keep stitches in, after the corneal wound has healed firmly, and in my second case removed them at the end of the ninth day. The advantages of this method are: its simplicity, the ease with which it can be done, its freedom from pain, that it can be done at the time of the operation, and that it can be used even in doubtful cases."

C. H. M.

Cure of Chronic Catarrhal Inflammations of the Lacrimal Canal with Preservation of the Normal Anatomical Relations.

BYERS, W. G. M., Montreal; (*Ophthalmic Review*, Feb., 1904.) The writer traces the origin and initial changes in these cases to the inferior meatus, analogous to the beginning of chronic catarrhal otitis media at the mouth of the Eustachian tube. Many cases of epiphora occur only when the nasal mucosa is unduly swollen, and are promptly relieved by painting the inferior turbinate with adrenalin, others by direct application of this drug to the opening of the duct, followed by nitrate of silver (2 per cent. to 4 per cent.) or argyrol (10 per cent. to 20 per cent.) every two or three days. The same drugs syringed through the lower canaliculus are effective in severe cases. This is done without slitting up the canaliculus, by clamping the upper punctum and using "a snub-nosed" syringe to prevent regurgitation of fluid. Obstruction is overcome by injections of adrenalin made at short intervals, without removing the syringe, so that the mucous membrane, being contracted little by little from above downward, the fluid can eventually be forced through.

Apart from states of simple congestion and hypertrophy, routine examination will reveal nasal conditions (polypi, pressure on lower end of duct by septal spur, etc.) which are the direct cause of the blockage.

P. N. F.

Corneal-Ulcer Notes.

GIFFORD, H., Omaha, (*Ophthalmic Record*, March, 1904).

discusses the substitutes for the Saemisch cut and the theory of its action in the various forms of corneal ulcer. The author believes that since the introduction of the galvano-cautery there is a tendency to overlook the importance of the Saemisch incision and states that the advantages which it possesses over most of its substitutes are due, first, to the extent of the opening and, second, to the fact that it is made through tissue thinned and partly disorganized, so that the closure of the wound is delayed as long as possible, and when it occurs, the union of the thin edges is easily broken up by the intra-ocular pressure.

He gives as the main objection to the Saemisch cut the fact that it is liable to produce a large anterior synechia and to overcome this, Gifford, in order to keep the anterior chamber open, adds to the burning of the ulcer with the cautery, the puncture of the chamber with the same instrument.

The author indorses the use of trichloracetic acid in the treatment of corneal ulcers, using the acid practically pure, and prefers it to the use of iodine. In the severer forms of ulcer he resorts to the galvano- or Paquelin cautery and is convinced that, in the severer forms, he gets better results with the Paquelin than with the galvano-cautery. W. R. M.

Some Notes on Bullous Keratitis.

HANSELL, HOWARD F., Phila., (*Ophthalmic Record*, March 1904), discusses this somewhat rare disease and gives the clinical history of two cases.

In the first case there had been sudden loss of vision with intermittent pain in the right eye three months previously; at time of examination, the lower part of the cornea was opaque and contained the remains of a ruptured vesicle. Adhesions of iris to anterior capsule of lens; pupillary portion of capsule opaque. T. normal. Ciliary region sensitive. Vision in left eye failing for past two days and moderate amount of pain. Central part of cornea had lost its transparency. Iris slightly swollen. Double iridectomy done with following result: the right eye improved at once, inflammation subsided and vision improved from light perception to 10/200. In the left eye the disease advanced, vision being reduced from 20/50 to 3/200.

In the second case, woman aged forty, cornea opaque and thickened in its central area, lens capsule opaque and iris ad-

herent. V=light perception. Recurring attacks of pain, iridectomy done, result good, with improvement in vision. Clinically the author divides keratitis bullosa into three classes: 1. traumatic, 2. keratitis bullosa in eyes hitherto healthy, 3. keratitis bullosa in eyes previously diseased.

Hansell attributes the relation between glaucoma and keratitis bullosa as being probably due to an interference with the nutrition of the cornea and perversion of nerve action dependent upon diseases of the lymph system of the eye.

W. R. M.

Ulceration of the Cornea Due to Infection with *Bacillus Pyocyaneus*.

McNAB, AUGUST, Freiberg. (*Ophthalmic Review*, March, 1904.) The writer describes a case of round ulcer in which bacteriological examination showed rapid growth, on agar, of round colonies, running together and forming a thick shiny growth, greenish-blue fluorescence of the medium developing. Blood serum was rapidly liquefied. Bouillon clouded rapidly, with green discoloration in 24 hours. The hanging drop showed rapidly moving bacilli.

Infection of the eye with the bacillus of blue pus is very rare, and the result very severe. Without a perforation wound or even any definite injury, a severe keratitis with hypopyon is produced, passing on to necrosis and sloughing of the superficial lamellae of the cornea. The discharge is a greenish-yellow pus. The process is rapid. Early and free opening of the anterior chamber by a Saemisch section seems to offer some hope of warding off panophthalmitis. Other infections of the eye with pyocyaneus are panophthalmitis following perforating wound (Haab), dacryocystitis (Terson), keratitis (Herbert) producing small lid-abscesses by inoculation.

P. H. F.

Frontal Sinusitis and Ophthalmoplegia Interna Partialis.

FISH, MANNING H., New Orleans. (*N. Y. Med. Jour. and Phil. Med. Jour.*, Feb. 27, 1904.) The writer describes four cases from the oculist's standpoint, and claims that the most constant, hence the most often complained of symptom of a frontal sinusitis, acute or latent with exacerbations, is eye-strain or asthenopia consequent to an accommodation paresis. In all his cases there was recession of the near

point which was corrected with relief of the sinus affection after "drainage" by means of syringing through the nose.

"Most of the published cases are of the severe type, with one or more of the following symptoms: severe neuralgic pains, fierce headaches, edema, redness, epistaxis, exophthalmos, tenderness on pressing or tapping on the orbital bones, orbital infiltration or perforation, fistula, paralysis of some nerve controlling the excursions of the eye, or in purulent infections, some constitutional symptoms, such as chill, fever, loss of appetite, vertigo, nausea, and vomiting, etc. But a sinusitis that can cause a distressing asthenopia may have no other symptoms, save neuralgia, and even this symptom may be entirely lacking.

A failure of diagnosis, especially in mild cases is not surprising. First, there is frequently an almost complete absence of any nasal diagnostic symptoms, and there may be an absolute negative finding by the rhinologist, and second, the symptoms in the acute stage and during the exacerbations manifest themselves especially in and about the eye, and the writers of works on ophthalmology do not, as a rule, touch the nose or any of its appendages."

The author considers sinusitis to be an etiological factor of myopia "by causing engorgement of the ciliary muscle and reducing accommodation range and power, thus invoking ciliary spasm," and accounts for many cases diagnosticated as hysterical amblyopia, and the neurasthenia of childhood.

In résumé, ophthalmoplegia interna partialis, coming on suddenly, appearing at different intervals and of variable degrees (position of near point changeable) in all emmetropic eyes or one made so by correction, when not attributable to some known cause, is very suggestive of a sinus involvement.

P. H. F.

Vernal Catarrh: A Pathological Study.

JOHNSON, R. H., Baltimore, (*Ophthalmic Record*, April, 1904) gives the pathological findings in a case of vernal catarrh. Microscopic examination of specimen from the bulbar conjunctiva as follows:

With low power, the epithelial covering thicker than normal, dipping at points down into the stroma; some of the invaginations extending almost to base of growth. Beneath the epithelium is the connective tissue stroma and toward

the base are leucocytes and connective tissue cells. High power shows eight to sixteen layers of epithelium with three distinct strata. Outer layers flat or squamous, nuclei absent or poorly defined, next few layers of polygonal cells with deeply staining nuclei, innermost layers composed of cylindrical cells with deeply staining oval nuclei.

At one point where one of the epithelial processes is cut, the epithelium resembles the nest of the epithelioma, the connective tissue stroma proceeds from the base toward the periphery and ends at the epithelium. A few mononuclear and polynuclear leucocytes present. Section is poor in blood vessels. Macroscopically the growth resembles papilloma, microscopically it resembles fibroma and epithelioma with this difference, that in epithelioma the cell proliferation is progressive and invading, and is not stopped by a hyperplasia of the subjacent tissue as in vernal catarrh. The author adds that according to Virchow a tumor should be designated fibroma where the connective tissue predominates, and where the epithelial proliferation is greater the growth must be epidermoidal or papillomatous in character.

From the microscopic examination the conclusion is drawn that the disease is probably not a catarrh, but a form of new growth consisting essentially of epithelial and connective tissue proliferation.

W. R. M.

Circumcorneal Hypertrophy (Vernal Conjunctivitis) in the Negro.

BURNETT, SWAN M., Washington, D. C. (*The Amer Journ. of Medical Sciences*, Feb., 1904.) The writer considers opinion far from settled as to the peculiar manifestations of this singular affection in the negro of this country. He refers to his paper published in the *Archives of Ophthalmology* for 1881 in which the phases of the disease as it appears are pointed out; since these in the negro were apparently not at first thoroughly understood or not confirmed by other observers, he reverts to the subject in order to harmonize views and clarify some seeming obscurities.

It seems to be a question with some whether the appearances described are not those of phlyctenular conjunctivitis. "A rather extensive study of the disease (principally by Europeans) since Saemisch first reported upon it in 1876 has not added greatly to our very limited knowledge of the cause

and pathology of the affection. The clinical characteristics of that feature of the disease manifest on the globe are so distinctive that it seems quite impossible that anyone who has once seen a pronounced case could be mistaken in the diagnosis, so utterly unlike any other known condition is it. The above-mentioned opinion of some well-known and accurate observers that it may be a form of phlyctenular disease leads me to think that they have never seen a typical case of circumcorneal hypertrophy; from which we may infer that the affection is much more frequent in some sections than in others, a fact that may be found of no small etiological importance, and give a clue which should be assiduously followed up.

Those of us whose work lies in the localities where the negro abounds are well aware of the great frequency of scrofulous or strumous affections of the cornea and conjunctiva in that race, and can confirm Dr. Bruns' statement as to its frequent cause of blindness and greatly impaired vision. But there is no manifestation of this diathesis, either on the cornea or conjunctiva, which at any stage bears any resemblance to the ocular form of circumcorneal hypertrophy as found in the negro. The clinical features of scrofulous conjunctivitis are marked by certain constant and well-recognized characteristics. When it appears under the distinctly phlyctenular form the elevations are discrete, though they may be several in number. Whether the inflammatory symptoms are slight or severe, the natural history of the phlyctenula is the same; its wall bursts, its contents are discharged, and an ulcer results, which heals, as we know, with a very greatly varying rapidity. Photophobia and lacrimation are rarely absent, and may be present in the intensest degree. When the manifestation is on the cornea itself, the exudate is still more or less circumscribed and small, with a very variable amount of destruction of tissue and cicatrical formation as a result.

On the other hand, the distinguishing mark of circumcorneal hypertrophy is that it is *not destructive*. It is a true hyperplasia, and it was with a view of making this essential feature prominent and descriptive in nomenclature that I adopted the name "circumcorneal hypertrophy" as the best synonym of the "hypertrophie perikeratique" of Desmarres and the "gallertige Verdickung des Limbus" of Graefe. The

hyperplastic character of the pathological condition has been confirmed by all examinations of the tissue that have been made. Scheile has shown that the principal change in the circumcorneal form is in the epithelial layer, manifested by a largely increased number of the cells with invaginations, constituting the so-called "cancroid formations" together with some increase in the connective tissue. A drawing representing these appearances is given in my chapter on "Diseases of the Conjunctiva" in *Norris and Oliver's System*. Some more recent investigations made by de Schweinitz and Shumway, and published in the *University of Pennsylvania Medical Bulletin* for June, 1903, reveal identical changes in the conjunctiva of the lid. Everywhere there is hypertrophy and nowhere a destruction of tissue."

The writer has observed cases of this disease every season since 1881 and has never observed any tendency toward destructive ulceration—if the latter exists, the disease is not circumcorneal hypertrophy. There are cases in which the symptoms of irritation are considerable, especially when, in the palpebral form, large hard excrescences rub on the cornea; but there is never an involvement of the cornea aside from the hypertrophy. The characteristic complaint is not of pain, but of an itching or burning sensation quite distinct from the subjective symptoms of phlyctenulae.

The objective appearances are also strikingly different especially in the bulbar form, the dirty gray elevations at the base of the cornea bearing no resemblance whatever, when they are marked, to any other pathological condition found here. "There is an aspect of the eyes, due to the peculiar appearance of the palpebral aperture, which, once seen, cannot be taken for anything else. The "white" of the eye in the negro, especially in the young, is very clearly marked, often brilliant, in contrast with the surrounding dark skin. In circumcorneal hypertrophy this is changed. The palpebral aperture has a dull, soggy look, and a dusky appearance, as though it had been smoked. This "smoked" look is not always of the same intensity, but even in mild cases is sufficiently pronounced to be recognized at a distance of many feet. In no other affection of the eyes in the negro have I encountered this singular look of the palpebral aperture. A closer examination shows the cause of this "smoked" appearance to be a pigmentation of the conjunc-

tiva, which is more or less thickened and easily thrown into folds with the movements of the ball inward or outward. The epithelium has some of the lack-luster look which is seen in a greater degree in xerosis of the conjunctiva. The smoky look is confined almost entirely to the space exposed by the palpebral fissure. The parts usually covered by the lids are not affected. The pigment is usually in very small, dot-like points, to be differentiated only under a magnifier, but toward the base of the cornea it may be in quite large masses, some of which measure a quarter of a millimetre in diameter. This smoky look of the palpebral aperture disappears with the subsidence of the disease during the colder months, when the eyes return to approximately their normal appearance; not always, however, for there are occasional cases which continue, with all the characteristic appearances during the winter months, though commonly with diminished intensity.

Statistics of the writer's and of other clinics in Washington show that the negro in this section is much more prone to the disease than the white race. Opinions differ as to the relative frequency of the bulbar and palpebral forms. Burnett believes that they both exist together, but one may be so slight as to escape detection unless carefully looked for, and that the same patient may have one or the other form more pronounced at different seasons.

"That the disease is the manifestation of a dyscrasia seems certain, but it is not so certain what that dyscrasia is. Of course, we can never exclude what we call scrofula in any patient of the colored race, and yet there is nothing about the appearance of the condition itself or in the patients which would justify the acceptance of any such stigma as a cause. It occurs often in the most robust-looking, with none of the usual signs of deficient nutrition. I have looked in vain for some connection of inherited syphilis with the disease. In my experience the male and female sexes are about equally represented; and while principally an affection of childhood, the adult is by no means free."

The possible relationship of the disease to trachoma has attracted attention, since the granular condition of the lids suggests the appearance of the latter disease. The similarity is only superficial, the essential nature of the two affections being diametrically opposite; in trachoma the ac-

tion is destructive, while in circumcorneal hypertrophy it is purely hyperplastic and when the condition subsides for the winter, the conjunctiva assumes almost if not quite a normal appearance. Another point of interest in this connection is that in Russia, in which country trachoma is extremely prevalent, spring catarrh is practically unknown; in this country, too, the negro is practically immune from trachoma but as shown above, often presents the other affect on.

"In regard to therapeutics, the indications in view of what we know of the pathology, are for palliative local measures. Operative procedures, such as excision of the masses, expression, etc., have been recommended and practised, but evidently are not advisable. Attention to the nutrition and an improvement in the general condition are more properly called for. Arsenic administered in some form meets with the approval of most of those who have written upon the subject."

C. H. M.

A Case of Crypto-Glioma of the Retina.

ALLEMAN, L. A. W., Brooklyn, N. Y., (*Brooklyn Med. Journal*, May, 1903), presents a case of crypto-glioma of the retina with the following history: Patient, female, aged 16 months. Family history negative. At the age of three weeks a white spot appeared in pupil of right eye; three months later eye became inflamed and "swelled up." Child was taken to a doctor who opened the "blister;" inflammation subsided and eye ball shrunk to its present condition, a phthisis bulbi. When a year old a similar white spot (white reflex) appeared in left pupil.

Present condition of left eye; slight nystagmus, pupillary reaction good, dilates slightly under homatropine, tension +, no red reflex, yellowish white mass on nasal side, extending forward toward ciliary region, tumor shading off into fundus. Tension + 1. Diagnosis crypto-glioma. The author discusses the pathology and classification of glioma, dividing it into three stages. 1. Intra-ocular growth, with no inflammatory manifestations or increased tension. 2. Increased tension ending in rupture of the globe, necessarily inflammatory. 3. Extension and metastasis; and adds that it is in the presence of an interval between the second and third stages that crypto-glioma differs from ordinary glioma and that the difference is probably due to the accidental obliterating of nu-

trient vessels, rather than to any fundamental departure from the usual type. The author also gives Schöbl's classification of crypto-glioma as a clinical type, which is based on the manner of its anatomical growth, as follows: 1. Simple glioma of the retina. 2. Glioma retinae luxurians. 3. Crypto-glioma of the retina.

The first is the simple and most common form; the second, glioma luxurians, less common, is characterized by the later appearance and less rapid development of the regressive metamorphosis; the third form, crypto-glioma, a term suggested by Schöbl to describe a rare form which he has demonstrated microscopically to be a variety of the true glioma.

Alleman gives Schöbl's description as follows: "At first the cases grow after the first type, enter the vitreous chamber and may fill the eyeball and be disseminated into the choroid and optic nerve. They then undergo regressive metamorphosis from a tendency of their own, which may be favored by inflammatory processes in the eyeball, such as iridocyclitis and chronic panophthalmitis. After the primary growth has thus degenerated, the fluid parts of the eyeball may be absorbed and the eye shrink, in consequence of the inflammatory process, so that it presents the picture of progressive bulbar or anterior or complete bulbar phthisis. After a varying interval the disseminated patches in the choroid or optic nerve, or in both, begin to grow again. They either fill the eyeball, increase in size again, break through it, and lead to the well known end."

The author gives the differential diagnosis between glioma and other forms of malignant tumors, and between glioma and pseudo-glioma and emphasizes the extreme difficulty, in some cases, in making a diagnosis of crypto-glioma if seen during the stage of quiescence, and in his case it was only by the history and by the presence of a growth in the fellow eye, that he was able to classify it as a case of crypto-glioma.

W. R. M.

Retinal Symptoms of Vascular Degeneration.

ALLEMAN, L. A. W., M. D. (*American Medicine*, Feb. 20th, 1904.) The author divides the data from the examination of numerous eyegrounds into four groups:

In the first group are those cases with no organic lesion but a tortuosity of the smaller retinal vessels and of the

terminal twigs. There are seldom any general symptoms in this group of cases, the patients feel well, except perhaps for headaches or general lassitude and symptoms of poor elimination.

In the second group there is a similar condition but in addition there is a bending of the vessels at the crossings. There is a condition of spasm of the vessels confined to small areas and sometimes changing the location during an examination. The symptoms in this group are frequently hemicrania, or neuralgia, with no organic lesion; the patient's condition may vary from perfect health to nervous prostration.

In the third group some evidence of organic change in the vessel walls can be made out; tortuosity is present, the curve at the crossing is more pronounced and the blood stream of the underlying vessel is obscured the coat is visible as a slight haze on either side of the red line of the upper vessel, rarely there are spasmodic changes in the calibre of the vessel, there are minute hemorrhages and small white areas of absorbed hemorrhages.

Here the symptoms usually show some evidence of vascular degeneration, the radials are resistant; frequently there is a cardiac hypertrophy; the urine will usually show urea, low specific gravity, occasionally albumin, hyaline or granular casts.

In the fourth class are included all cases presenting advanced vascular disease, such as hemorrhagic, albuminuric, and diabetic retinitis. The diseased condition of the vessel walls is readily seen and loss of elasticity is readily shown by the deep depression at the crossings and by the obliteration of the blood stream by the wall of the upper vessel. Many lesions are found in this group but the three chief types are (1) the hemorrhagic, (2) the degenerating (classic Bright's retina), and (3) active type showing a neuroretinitis, or intense papillitis, and sometimes thrombosis of a retinal vessel.

In this class of cases, organic lesions will always be found; in the case of a retinal hemorrhage the gravity of the case will depend on the age of the patient; frequently albuminuric retinitis is found in the routine examination of the refraction of patients in perfect health and without impairment of vision. The prognosis is always bad, the patient usu-

ally not surviving the appearance of the retinal condition for more than two or three months; patients with neuroretinitis and thrombosis are apt to suffer from cardiac dyspnea and general anasarca.

The inspection of the retinal vessels is of the greatest value as an aid in determining the general physical condition.

M. D. S.

Astigmatic Changes.

POHLMAN, JULIUS, M. D. (*American Medicine*, March, 1904.) These are the results found from the examination of some 900 cases which were re-examined from one to ten times at intervals, varying from 6 months to 5 years, all below 50 years and under a cycloplegic. Only cases in which a definite change could be measured and in which patients reported satisfactory improvement due to change of lenses were included.

Up to 10 years.	37	among	100	changed
from 10 to 20 "	28	"	"	"
" 20 " 30 "	36	"	"	"
" 30 " 40 "	31	"	"	"
" 40 yrs, up	28	"	"	"

At the different ages the changes were with about equal frequency. According to the findings, sex, age, hypermetropia, and myopia are not factors.

Among the 900 re-examined, nearly every third showed changes in the astigmatism, 50 per cent. simple increase in quantity without changes of axis; 31 per cent. change of axis merely; 19 per cent. divided between, (1) increase of astigmatism and change of axis, (2) change of regular to irregular astigmatism, (3) change of irregular to regular astigmatism.

M. D. S.

Non-Operative Relief of Eyestrain for the Possible Cure of Epilepsy as Tested in Sixty-Eight Cases at the Craig Colony.

SPRATLING, WM. P., M. D. (*American Medicine*, April 2, 1904.) George M. Gould of Philadelphia tested at Craig Colony 78 out of 800 patients. The majority of the cases were young middle aged men and women, regardless of the condition of epilepsy.

The examination was the routine one conducted as follows: thorough paralysis by homatropine, muscle imbalance tested, ophthalmoscopic examination, refraction errors measured objectively by retinoscope, subjective examination.

The variety of refractive errors was large, 50 per cent. unsymmetric astigmatism, 20 per cent. myopic astigmatism, 80 per cent. hypermetropic astigmatism, 22 per cent. normal after correction, 44 per cent. with 20/40 or less vision after correction.

The results were varying, some had more attacks after wearing the lenses, some fewer. There was one arrest in which cure seemed probable. Five cases already arrested seemed to have the cure sustained by the use of the glasses. There was a decrease in the number of attacks in eleven cases. A few showed improvement immediately after wearing the glasses but the decrease did not last. A large number (64 per cent.) had an increased number of attacks after wearing the lenses. Seizure variations in epilepsy are frequently marked, however. In 16 cases there was no change in the number of attacks. To the author this experiment seems only to furnish additional proof that in looking for the causes and cure of epilepsy we must consider more than a single organ and its abnormalities. We must include the entire body and all its parts, especially those of unstable consistency that are subjected to constant alteration and changes in composition.

Gould in an addendum to this article construes the data to a favorable conclusion as follows:

That 19 patients whose attacks were lessened had 3 months prior to lenses 861 attacks, 3 months following the lenses 479 attacks, a decrease of 44 per cent. M. D. S.

Eye-strain Considered as a Factor in the Production of Lateral Curvature of the Spine (Preliminary Communication).

KILBURN, HENRY W., Boston. (*Boston Med. & Surg. Jour.*, March 24, 1904.) "Every ophthalmologist is familiar with the fact that astigmatic patients, when one or both axes are oblique, and patients having vertical heterophoria, are apt to tilt the head to one side in order to obtain clearer vision. Also, there have been reported some cases of torticollis in which there has been a marked improvement in attitude

after correction of the refractive error and relief of any existing vertical heterophoria. It has been my lot to see a number of cases of lateral curvature of the spine in which eye-strain seemed to me to play a part in producing the condition. In two of these cases there was a progressive myopia, and not only did relief from eye-strain seem to cause a marked improvement in attitude, but, when the curvature had been corrected by appropriate exercises, the myopia stopped increasing. Also in one of these two cases the vision improved to an unusual degree after correction of the spinal curvature and improvement of the general nutrition. The cases are too few in number to permit of dogmatizing on the subject; but I think that the results justify my belief that there is, in some cases, at least a connection between eye-strain and spinal curvature."

The writer describes briefly three cases which he considered typical; in these patients eye-strain has acted as an indirect factor in the production of spinal curvature by inducing a faulty attitude; when the curvature had become established, the stooping position caused the patients to approach the eyes too near the desk, and caused an increase in the myopia. He alludes to Scholder's paper on "Die Schulscholiose und deren Behandlung" in which a close relationship between myopia and scoliosis was established and in which the amount of myopia was in direct proportion to the amount of scoliosis; these statistics were based upon an examination of 2314 school children, 571 of whom had a spinal curvature.

C. H. M.

The Mechanism of Accommodation in man.

GROSSMAN, KARL, Liverpool. (*Ophthalmic Review*, Jan., 1904.) The writer gives the result of examination under atropine and later, eserine, of a patient with congenital absence of the iris and a small "chalk mark" at the anterior and posterior pole of either lens; this subject was ideal for the study of the two theories of accommodation, that of Helmholtz and of Tscherning; the former claims that increased curvature of the lens is produced by relaxation of the zonula due to contraction of the ciliary muscle, the latter that it is produced by tension of the zonula, similarly produced. The author's investigations carried out with the retinoscope, the corneal microscope, and the reflex

images of Sanson-Purkinje, show that the anterior surface of the lens changes its spherical curve into that of a cone during accommodation. The second feature is a decided tremor of the lens, coming on from five to ten minutes after the instillation of eserine, proving that the zonula has slackened and, as Hess has shown, that the pressure in front and behind the lens must be the same during the height of accommodation. Third, the ciliary processes make a centripetal movement toward the visual axis but do not move toward the cornea. Fourth, the circumference of the lens at its equator remains perfectly circular but decreases considerably. Fifth, the antero-posterior diameter of the lens increases by fully one third. Sixth, the anterior surface of the lens approaches the cornea, but the lens itself does not move forward.

In a condition of rest, the posterior surface of the lens was practically spherical; after eserine, an increased curvature of the central portion of this surface, with flattening of the peripheral portion, appeared.

P. H. F.

The Mechanism of Accommodation.

TSCHERNING, M., Paris. (*The Ophthalmic Review*, April, 1904.) The writer replies to Grossman's article, given in abstract above. His latest conclusions are as follows:

1. The change in the anterior surface of the lens produces about six-tenths of the accommodation; the change in the posterior surface four-tenths.

2. The lens increases in thickness; the anterior surface moves forward, the posterior surface moves slightly backward.

3. The anterior surface becomes flattened toward the periphery, and the curvature in the middle increases.

4. The posterior surface also become flattened toward the periphery as shown by a difference of five or six dioptries between central and peripheral accommodation, while only three dioptries are accounted for by the anterior surface.

P. H. F.

Optic-Nerve Atrophy Following Iodoform Poisoning.

SNYDER, W. H. Toledo, Ohio. (*Ophthalmic Record*, March, 1904.) A clinical history of a case of optic nerve atrophy to absorption of iodoform powder from an ulcerated surface at the site of a hernia.

At time of first examination there was a retinitis and papillitis in both eyes. Eighteen months later the optic nerves were pale and atrophic. W. R. M.

Primary Chancre of Conjunctiva Followed Ten Years Later by Interstitial Keratitis of the same Eye.

MARLOW, F. W., Syracuse, N. Y., (*Ophthalmic Record*, March, 1904.) Patient aged fifty-four years, at time of first examination presented a characteristic chancre in the lower conjunctival retro-tarsal fold of the right eye. Ten years later an interstitial keratitis appeared in the same eye.

W. R. M.

Corectopia and Ectopia Lentis. Extraction of the Opaque and Dislocated Lens.

WESCOTT, C. D., Chicago, (*Ophthalmic Record*, March, 1904.) Patient, male, age 53 years, had always had poor vision; pupil in left eye was displaced upward and outward, to such an extent that it was covered by the upper lid when the eye was directed straight ahead; pupil in right eye displaced in same direction, upward and outward. Lenses dislocated and part opaque. Vision with right eye was equal to counting fingers at five or six feet; with the left somewhat less. Patient had been using a solution of atropine for a number of years, but he found that it no longer affected his pupils and sight was becoming less.

Iridectomy was made, down and in, upon left eye and ten weeks later the dislocated and part opaque lens was extracted; five days later, on account of the patient getting up and walking to the bath room, the wound opened, some vitreous escaped and a violent iridocyclitis followed. Final result with correcting lens was 6/15 vision.

Iridectomy was made on right eye, giving 6/30 vision with approximate correction. Lens not yet extracted. W. R. M.

On Dionin.

DARIER, A., Paris. (*The Ophthalmoscope*, March, 1904.) After four years' personal experience with dionin, Darier claims that, in many circumstances, this agent is more valuable than even cocain, although its proper worth still remains unappreciated by many.

Although the application of dionin to the eye is painful,

undue stress has been laid upon this feature by those who have chanced to fall upon a patient hypersensitive to the product. "When the surgeon warns his patient with regard to this point and insists that the temporary discomfort will be followed by marked therapeutic results, there will be no difficulty about putting up with the pain. Moreover dionin should never be placed in immediate contact with the cornea. Hence, solutions, and especially the substance itself, should be placed well in the lower cul-de-sac, and in extremely sensitive patients, cocaine may be dropped into the eye before a tiny drop of 2 per cent. dionin is used. If the effect is not sufficient in ten minutes, one or two drops of the 5 per cent. solution are employed, or if a yet stronger effect be desired, a morsel of powdered dionin may be used or the solution may even be injected beneath the conjunctiva.

Dionin sets up lachrimation, sneezing, and more or less chemosis of the conjunctiva, effects too well known nowadays to insist upon them. The results, however, may be so marked that a practitioner who is ignorant of them may be as much startled as the patient himself. In case of a too violent reaction, a bandage may be applied and kept in position until next day, when a bettering of the pathological process for which dionin was used will nearly always be observed. Thus in detachment of the retina when no result has followed several sub-conjunctival injections of sodium chloride, I can hardly recommend too highly injection, along with the saline fluid, of one or two centigrammes of dionin. The reaction is most violent. The swelling of the conjunctiva and eyelids is enormous. But the curative result is correspondingly pronounced. By these means I have succeeded in obtaining re-attachment of the retina under conditions the very reverse of favorable. The facts of the case were these: the first eye had been lost twenty years as the result of detachment. The other eye operated upon for cataract five years ago, had had with 12 D. vision of 1/2, but for two months sight had been completely abrogated, owing to complete detachment of the retina. After twelve sub-conjunctival injections without result, I made one injection of two centigrammes of dionin. Two days after the little operation the retina was completely re-applied.

Dionin is the physiological antiseptic *par excellence*. The

lacrimation, hyperemia, edema, and chemosis provoked by the agent constitute a set of phenomena which well deserves the name of *Lymphüberchwemmung*, given to them by Wolffberg. This lymphatic inundation washes not only the surface of the eyeball but also the sub-conjunctival and intra-corneal lymph spaces, and perhaps the intra-ocular spaces. There is, further, not only an afflux of liquid but of lymphocytes charged with the defence of the parts, so that there is a more active production of antitoxines and of phagocytes."

This conjunctival flushing may be useful in some forms of chronic conjunctivitis to hasten resolution of the morbid process and to render subsequent cauterizations more effective. The writer also uses it to prepare the field the night before an operation for glaucoma, cataract, etc. In acute or subacute glaucoma he invariably applies dionin which causes the eye to become much less sensitive to operative procedures; this has often allowed him to dispense with chloroform. He was in the habit of using the remedy as an antiseptic after cataract extraction, but on one occasion such violent sneezing was set up that the wound was re-opened; he does not now use the remedy immediately after the operation but always employs it after the first dressing on the third or fourth day.

He advises its invariable use before the dressing is applied in operations which do not involve the cornea, even after the removal of foreign bodies, particularly if the foreign substance has provoked a zone of infiltration; rapid absorption of the exudation is the result. When the foreign body is so firmly fixed in the cornea, that neither gouge nor magnet will extract it, a little powdered dionin applied to the wound causes localized edema of the cornea and loosens the foreign body.

"In infective ulcers of the cornea, powdered dionin cleanses the suppurating surface. In slight cases hypopyon may disappear and cure result without having recourse to the galvano-cautery or subconjunctival injections. The most striking successes, however, are to be obtained in the so-called "strumous" ulcers of children, with or without hypopyon. In threatened suppuration after removal of cataract, the edges of the wound should be touched with powdered dionine. If violent reaction follows the application, there is a chance of success, but in the contrary event no time must

be lost before applying the galvano-cautery or making sub-conjunctival injections of mercuric cyanide. Inunctions with collargol ointment should also be practised every six hours, since these frictions have a real and potent action, provided they are carried out with energy and at regular intervals.

Recent, diffuse corneal infiltrations when superficial are promptly absorbed under the influence of dionin. The remedy is also useful in interstitial keratitis when used at the beginning and more especially toward the end of the disease; it is also of service in leucomata: the eye soon becomes tolerant to the remedy and it cannot be employed with good effect for longer than three consecutive days: hence the writer prescribes massage with calomel and lanoline for home use, and makes an energetic application of dionin every eight or ten days.

"Although dionin has little action as an anesthetic, yet it is a most useful analgesic. However it is a curious thing that an eye under the influence of dionin may be more deeply anesthetised than would otherwise be the case with cocaine. Under these circumstances, as I have said before, I have operated upon acute glaucoma that in the ordinary way would have required chloroform. Adrenalin employed under parallel conditions is a double-edged weapon, preventing hemorrhage during operation, on the one hand, but predisposing to hemorrhage after operation, on the other. The fact should be mentioned that analgesia by means of dionine cannot always be obtained, since some individuals are refractory to the action of the medicament. A poor old woman, 78 years of age, had lost one eye from glaucoma. The second eye, atrociously painful, was affected with extreme acute glaucoma when I saw the patient. The pain was subdued in a few hours with dionin, and the sight restored by physostigmine, after she had refused all surgical intervention.

Among other diseases in which dionin may render service. I may mention some forms of keratitis, episcleritis, and above all, certain kinds of iritis and iridochoroiditis, where not only does it relieve pain but facilitates resorption of exudation and dilation of the pupil."

C. H. M.

Dionin: A new Ocular Analgesic.

HINSHELWOOD, JAMES, Glasgow; (*The British Med. Journ.* April 30, 1904.) His attention being directed to dionin as an ocular analgesic on reading Darier's work on ocular therapeutics, the writer records his personal experience with this remedy in private and hospital practice, having used it extensively with great success.

Dionin, or ethyl-morphine hydrochloride, is a white odorless, crystalline powder, freely soluble in water. Hinshelwood used it chiefly in 5 per cent. aqueous solution, or made up with vaseline as an ointment of equal strength; where there is great lacrimation he preferred to use it in ointment form. Even in 2 per cent. aqueous solution, dionin has marked analgesic properties; where pain is not severe and the inflammatory condition of the eye is not very acute, this strength will prove quite sufficient. This agent is not an ocular anesthetic and consequently does not modify the sensitiveness of the cornea or conjunctiva. It is a powerful ocular analgesic; if the patient is suffering from a painful affection of the eye, such as iritis, iridocyclitis, glaucoma, ulcer or keratitis, the instillation of solution of dionin will always soothe and often give complete relief for several hours from the severe accompanying pain. This action is purely local as is proved by the fact that when both eyes are painful, relief is experienced only by the one into which the remedy has been instilled.

Cocain and holocain are both anesthetics and analgesics. But dionin, while not anesthetic, is superior in analgesic power to the former remedies. In the deep-seated pain produced by iritis, iridocyclitis, and glaucoma the analgesic effects of dionin are often of the greatest service.

"I have recently, in cases of deep-seated pain due to inflammatory affections of the eye, such as iritis, cyclitis, iridocyclitis, and glaucoma, carried out comparative experiments with regard to the power of cocain, holocain, and dionin in relieving pain. I have used three solutions—cocain 5 per cent.; holocain, 1 per cent.; and dionin, 5 per cent. I have used these solutions alternately in the same cases with the view to determine the degree and also the duration of the relief afforded. Cocain is by a long way at the bottom of the list both as to the degree and duration of the relief afforded. Its analgesic effects are not to be compared with

those produced by holocain and dionin in this particular class of cases. Cocain only gave very partial relief as compared with the great relief afforded by holocain or dionin. The analgesic effects of the dionin were found to be even greater than those of holocain.

With regard to the duration of the relief afforded, both holocain and dionin are much superior to cocain; but here, too, dionin was at the top of the list. The partial relief from cocain rarely lasted more than an hour, whilst the analgesic effects of holocain and dionin lasted for three and sometimes for four hours. For the relief of the severe deep-seated pain in inflammatory affections of the eye, both as regards degree and durations of the analgesic produced, I found dionin the most powerful agent, next to it holocain, and a long way inferior to both, cocain.

There is an occasional effect of the dionin regarding which the patient must be warned, otherwise it may cause him much needless alarm. After the first instillation, there sometimes appears an intense chemosis of the conjunctiva, which swells up and overlaps the cornea. This need cause no alarm as it rapidly subsides, and it is even an appearance to be welcomed, as in the cases where the dionin produces intense chemosis its analgesic effects seemed to be greatest. This chemosis of the conjunctiva appears only after the first or second intillation of the dionin, and never after the subsequent one, and need not interfere in the slightest degree with the regular use of the drug. I have never seen it after the use of 2 per cent. solutions, but only after the use of 5 per cent. solutions. The dionin drops or ointment may be used every four, six, or eight hours, accoring to the severity of the pain and the effects produced."

C. H. M.

The Therapeutics of the Ichthyol Compounds: with Special Reference to Ichthoform and Ichthargan.

BURNET, JAMES, Edinburgh. (*The Lancet*. March 12, 1904.) Ichthargan, the silver salt of ichthyol, is a brownish-black, amorphous powder, containing 28.7 per cent. of silver, and is quite odorless and tasteless. It is readily soluble in warm or cold water, in dilute alcohol and in glycerine, but insoluble in absolute alcohol, ether and chloroform. Its solutions are clear when freshly prepared, but become dark on exposure to light. It is relatively non-toxic. Solutions

should always be prepared fresh with sterilized water and filtered; such solutions are stable.

As regards the bacteriological properties ichthargan, Aufrecht has shown that it is more powerful than silver nitrate in its action on streptococcus, staphylococcus pyogenes aureus, and on the gonococcus; it was found superior to protargol and was found to possess greater penetrating powers; it was proven to be less poisonous than other silver salts. More than two-thirds of ichthargan is made up of ichthyol and hence it combines the therapeutic action of a silver salt with the valuable analgesic, antiseptic and anti-inflammatory effects of the former. It contains a large proportion of silver. It is comparatively non-irritating.

In the course of an article with the above-mentioned title, the writer has the following to say concerning the uses of ichthargan in disease of the eye:

"Save the value of a 0.5 per cent. ointment in cases of marginal blepharitis I cannot speak from personal experience of ichthargan as a remedy of importance in this connection. Fortunately, however, for my present purpose I am able to quote from the experience of others better qualified to speak on this matter than myself. Thus Guttman, of Breslau, has reported its use in 61 cases of eye affections. These include 25 cases of acute catarrhal conjunctivitis, 13 of chronic conjunctivitis, 7 resulting from affections of the lacrimal apparatus, 10 of trachoma, 6 of ophthalmia neonatorum, and 1 of serpiginous ulcer of the cornea. His conclusions may be summarised as follows: In congestive catarrh it proves efficient although it cannot be said to replace the older remedies for such conditions. He recommends that further experiments should be made regarding its use in ophthalmia neonatorum. In affections of the lacrimal apparatus it is a very useful remover of purulent secretion. Its chief action, however, is developed in the distressing forms of trachoma and it is one of the most useful remedies we at present possess for the medical treatment of pannus.

Marczel Falta, writing of his use of ichthargan in cases of trachoma, says that he has used it in all forms and at all stages of this disease. He found that fresh cases were completely cured by ichthargan in from 6 to 8 weeks. In chronic cases the pannus is reduced very speedily. He began with a 0.5 per cent. solution and gradually increased the strength

to 3 per cent. These solutions were brushed over the affected part and by this means a pannus showed retrogressive metamorphosis ("*Rückbildung*") in from three to four days, and a case of recent trachoma could be cured from six to eight weeks. Similar results were obtained by Gortoloff in cases of trachoma, who therefore considers ichthargan an excellent remedy for the treatment of trachoma and its complications."

C. H. M.

A New Color Test Appliance.

DUNN, PERCY, London. (*The Lancet*, April 23, 1904.) The following is a description of a new appliance for testing the color vision which, I venture to suggest, will be found useful for the examination of candidates for the various public services. It consists of a dead-black metal screen 14 centimetres in height by 9 centimetres in width, supported on two metal cross-bars. Just above the center of the screen there is an oval aperture about 3 centimetres in diameter; around the lower half of the aperture is fixed a double groove, similar to that in a trial spectacle frame, for the purpose of carrying the colored discs and diaphragms employed in the test. In addition to the above there are four colored mounted glass discs, blue, red, green and yellow respectively, one ground-glass disc, one smoke-glass disc, and three black vulcanite discs having central apertures, the diameters of which have been designed approximately to test the acuteness of the color vision at varying distances of 100, 300 and 500 yards. There is also a card upon which appear four squares colored to correspond with the four colored discs.

The method of using the test is as follows: The screen is placed upon a convenient table with a light behind it, the candidate to be examined is to be seated upon a chair at four metres distance. In the candidate's hand is placed the card with colored squares. One of the colored discs is then inserted in front of the aperture in the screen and the candidate is first asked to name the color and next to point it on the card. The remaining colors are similarly tested. Lastly the acuteness of color vision is further inquired into by inserting the vulcanite diaphragms in front of the colored discs. The ground-glass and the smoke-glass discs are for the purpose of delineating "misty" and "foggy" atmospheric condition.

C. H. M.

Dionin, a new Agent in Ophthalmic Therapeutics.

REBER, WENDELL, Philadelphia. (*The Therapeutic Gazette*, February, 1904.) gives his experience with dionin in the following conditions: Post operative complications—he gives the history of needling operation for secondary capsular cataract which was followed by severe iritis, infection in the vitreous with threatening panophthalmitis; no relief from atropin and salicylates. Ten per cent. solution of dionin was used every two hours; following day relief from pain, cornea clearer, iris better color—5 days later eye quiet and capsule lens had disappeared.

Iritis—in four cases relief from pain followed use of 5 per cent. solution of dionin after usual remedies had failed.

Interstitial keratitis—dionin was used in two cases and Reber believes that it hastened the absorption of the newly formed matter in the stroma of the cornea.

Vitreous opacities—result negative.

Corneal opacities—used in one case of leucoma following ophthalmia neonatorum, result negative.

Glaucoma—the drug was used in one case of absolute glaucoma in which a corneal ulcer had developed. Dionin was used combined in 10 per cent. solution with the previously used eserine solution; in 24 hours there was relief from pain and tension had fallen from stony hardness to +2. This lasted 6 days when the cornea ruptured.

Sympathetic ophthalmia. Dionin was used in one case and was found to be of marked service in promoting the absorption of plastic exudate.

Mode of action—The author states, that dionin is not an anesthetic and does not affect sensibility, but is an analgesic and a lymphagogue, that it produces redness and vascular dilatation, that the conjunctiva and eyelids may become swollen but that there is no danger.

In the light of our present knowledge of the drug, Reber believes that it acts by stimulating the lymphatic and vascular circulation of the eye.

Methods of use—It may be used as a powder, in solution, as an ointment, or in cocoa-butter rods. The powder may be used pure, one-twelfth of a grain being put into the eye (Darier); the rods may be used in 10 to 20 per cent. strength (Wolfburg). Von Arlt prescribes a 10 per cent ointment to be used with massage. Reber has used 5 to 10 per cent. solu-

ions and points out the fact that the eye develops a tolerance for the drug very rapidly, so that little or no effect will be secured longer than 6 or 7 days.

He summarizes as follows:

1. That dionin possesses properties at present inherent in no drug thus far used in ocular therapeutics.

2. That it is an analgesic of no little power and is frequently of value in alleviating the pain of iritis in those cases in which atropin does not relieve.

3. That the action of atropin seems to be enhanced by dionin.

4. That it has upon the eye a powerful vaso-dilator and lymphagogue action.

5. That it is of value if used to the point of distinct reaction in promoting the absorption of exudation deposits upon the anterior capsule in the pupillary space, and also in helping the absorption of post-operative debris after cataract.

6. That it certainly does help to clear up the corneal opacities in some cases of interstitial keratitis.

7. That it seems without effect in all other forms of corneal opacities.

8. That its influence on the glaucoma process is yet unsettled.

9. That it should be widely used and the effects of such use reported, in order that a final correct estimate of the value of the drug may be made.

W. R. M.

A Luminous Test Cabinet.

BLACK, N. M., Milwaukee, (*Ophthalmic Record*, April, 1904,) has devised a convenient and reliable test cabinet composed of a center pole which supports a square frame presenting on each of its four surfaces a porcelain chart containing the Snellen type. The charts are illuminated from within by four ground-glass 16 candle power incandescent lamps, which are operated by a switch at the trial case. The cabinet also revolves about the central pole and is controlled by the operator from the trial case.

The apparatus furnishes a uniform and standard illumination for the test type and is especially valuable in examinations for army, navy, railway and civil services where an absolute standard of vision is required.

W. R. M.

Notes on Some of the Newer Methods and Drugs in Ocular Therapeutics: Methylbromid of Atropin, Dionin, Subconjunctival Injections, Jequiritol.

HALE, A. B., Chicago. (*Ophthalmic Record*, Dec., 1903.)

A review of the therapeutic indications and uses of the above mentioned drugs, based upon an extensive use of the same by the author. Good results are obtained from the use of methylbromid of atropin in cases of corneal inflammation where the iris was sympathetically irritated but the author does not trust it in cases of genuine iritis. He finds that methylbromid dilates the pupil well, keeps the eye at rest and is of value when continued mydriasis is unnecessary. In regard to its cycloplegic effect he finds that this newer drug ranks below the sulfate, is equal to scopolamin or hyosin, and is superior to homatropin.

In regard to the duration of its effect upon the ciliary muscle he is able to answer the patient that he will not be debarred from work for more than two days, the drug being much quicker in its action than sulfate, 12 to 24 hours quicker than scopolamin and somewhat slower than homatropin. He then draws the following conclusions: That the methylbromid of atropin in a 1 per cent. aqueous solution is (1) a trustworthy mydriatic and a good cycloplegic in refraction, (2) an untrustworthy mydriatic in iritic, but a comfortable one in corneal inflammations, (3) its action begins about the same time as the sulfate, but has disappeared from two to six days before the latter, (4) it shows rank below the sulfate for complete action, but equal and above all other drugs.

As an anesthetic the author finds that dionin is not merely local but that its action is central as well, it subdues pain but not to a marked degree does it destroy local sensation. A tolerance is also soon established, after which the drug seems relatively inert. He concludes that while the drug is valuable in from 1 to 5 per cent. sol. that it is simply an adjuvant to other drugs, helpful in emergency but not trustworthy like cocain.

In the use of subconjunctival injections he prefers the 1 to 3000 and 1 to 5000 cyanid of mercury solution, to every 15 drops of which he adds 2 drops of a 1 per cent. solution of acoin. and reports good results from the same.

Jequiritol is prepared by Merck in four strengths from No. 1 to No. 4. No. 1 is non-irritating while No. 4 is excessively irritating. Hale uses the preparation in successive strengths until the desired reaction is obtained and report some good results in cases of trachomatous opacities. Clinical notes are given on six cases. W. R. M.

Subconjunctival Injections of Sodid Chlorid in Detachment of the Retina.

(Translated and abstracted by Dr. Casey A. Wood, Chicago, from *Annali di Ottalmologia*, Fasc. 9, 10, 1903, p. 650.) (*Ophthalmic Record*, Dec., 1903.) Favorable reports by Lodato, Mellinger, Dor, Schiess, Gemuseus and Marzoli, led Tarducci to give the use of subconjunctival injections of sodic chlorid a trial in his clinic and he concludes as follows: Injections of 3 to 20 per cent. sodic chlorid do absolutely no good in detachment of the retina of long standing. In recent detachment, injections of 2 to 10 per cent cause a slight increase in both central and peripheral acuity of vision but after 3 or 4 days the improvement is lost. In general the eye responds to the first two or three injections, but is not affected by subsequent ones. On the whole these injections give no better results than those obtained by the more usual methods of treatment. W. R. M.

A Shade to Protect the Examiner's Eyes from the Bright Light When Working with the Source of Light Close to the Mirror in Photoscopy (Retinoscopy).

STEVENSON, M. D., Akron, O. (*Ophthalmic Record*, Feb., 1904.) A device in the form of a hanging shade which may be attached to the cover chimney and excludes the rays of light from the unused eye of the examiner, when using the plane mirror close to the source of illumination.

A New Cataract Knife.

BLACK, MELVILLE, Denver. (*Ophthalmic Record*, Feb., 1904.) A probe pointed cataract knife used to supplement the regular Graefe knife, in cases where a portion of the iris has dropped in front of the blade of the Graefe knife while making the corneal incision. The blade of the Graefe knife is then withdrawn and after an interval of a few moments the probe pointed knife is inserted and worked up over the

iris and out at the counter puncture and the section completed without injuring the eye.

The instrument is made by Geo. Tiemann & Co., N, Y.

An Improved Eye Irrigator.

TODD, F. C., Minneapolis. (*Ophthalmic Record*, Feb , 1904.) An irrigator which will be found to be of especial value in all cases where it is desired to direct a continuous stream upon the eyeball, or to cleanse the lids from pus or mucus. The bottle and bulb can be conveniently grasped with one hand and the force of the stream can be easily regulated by pressure upon the bulb.

The irrigator is made by Chambers, Inskeep & Co., Chicago.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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AND

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PHILADELPHIA, PA.

Quarter ending June 30, 1904.

Choked Disc After Contusion of the Head.

BACHAUER, J., Augsburg. (*Deutsche Med. W.* 1904, p. 306.) B. observed 2 cases of this affection, rather rare after contusion of the head, which apparently was due to an intracranial hemorrhage. In the first case a fissure of the base was very probable since the left abducens was paralysed. B. emphasizes the importance of the ophthalmoscopical examination in such cases from a medico-legal standpoint, since changes of the disc, headache and vertigo may persist for a long time after the accident, while the patients may otherwise appear healthy and may have normal vision.

Syphilis and Tabes.

ERB, W., PROF., Heidelberg. (*Berl. Klin. Woch.*, 1904, Nov. 1-4.) E. completes his former statistics by 400 new cases of tabes in men of the higher classes and gives his conclusions from his observations on 1321 cases of tabes, his whole material within the last 25 years. 89.5 per cent. of 1100 men of the higher classes, 77.2 per cent. of 158 men of the lower classes, and 80 per cent. of 63 women, affected with tabes, were syphilitic. Syphilis is the most important and most efficient etiologic factor of tabes, almost a *conditio sine qua*

non. In the great majority of cases, tabes is a postsyphilitic affection, although not sufficiently elucidated in its pathogenesis.

With regard to the influence of gonorrhea, E's statistics are rather negative. Almost always gonorrhea was associated with syphilis, when tabes resulted. On the other hand, tabes relatively rarely follows syphilis, not more than in 1 to 3 per cent. The reason of this is that syphilis alone does not suffice to produce tabes. It apparently requires other elements as accidental causes, e. g., colds, overexertion, traumatism, sexual excesses, poisons like alcohol, tobacco, ergotin, infectious diseases, especially influenza, and the nerve-exhausting effects of civilization. Erb considers the cytologic diagnosis by lumbar puncture, initiated by Widal and taken up by E's assistant, Dr. Schoenborn, of enormous importance as to the intimate connection between syphilis and tabes. These investigations showed not more than 2 to 4 lymphocytes in a certain microscopical visual field of normal cerebrospinal fluid, but to 20 to 50 to 200 in cases of active syphilis of the meninges, spinal cord or brain, and without exception, so to speak, in recent or chronic cases of tabes, and progressive paralysis, i. e., the so called meta-syphilitic affections, where absolutely no increase of lymphocytes existed in other chronic cerebral and spinal lesions. With regard to the treatment, E. says that he saw quite a number of cases, in which a rational, repeated specific treatment, combined with tonics, was of undoubted success, but a perfect recovery was never obtained. The reader will find it very interesting to resort to the original article:

**On the Etiology and Pathology of Tabes, Especially its
Relation to Syphilis.**

LESSER, F., Berlin. (*Berl. Klin. Woch.*, 1904, No. 4.)

L. divides all constitutional syphilitic manifestations into papular (secondary) gummatous (tertiary), and interstitial inflammations, which he calls quartary syphilitic manifestations. The 1st group reacts to mercury, the 2nd to iodine, the 3rd to neither. Types of the quartary form are fibrous orchitis, the syphilitic lobulated liver, aneurysms, smooth atrophy of the tongue, to which L. adds tabes. Tabes is due to degeneration of nervous elements, secondary to interstitial inflammation. A localized interstitial inflammation in the spinal

cord suffices by interrupted conductions, to produce degeneration of a whole system of fibers. Of all causes of tabes, syphilis is the most important. L. recommends in every case of tabes to try mercury and iodine, or iodine alone, but to discontinue them if no speedy improvement is noticeable.

On Cyto-diagnostic Examinations of the Cerebro-spinal Fluid.

MEYER, E., Kiel. (*Berl. Klin. Woch.*, 1904, No. 5.) The cerebro-spinal fluid drawn by lumbar puncture, contains normally 3 to 4 lymphocytes in the visual field of Leitz 7, i. e., 300 to 400 diameters. Their number increases to 10 or 20 in lymphocytosis. M. examined 35 cases of the psychiatric clinic in this way and found in concordance with the French authors who devised this method, lymphocytosis in almost all cases, in which, with more or less certainty, an organic disease with chronic meningitic irritation existed. M. emphasizes the diagnostic value of lymphocytosis in distinguishing organic from functional diseases. As to the origin of the lymphocytes, the alteration of the bloodvessels in meningitic processes must be considered and according to Anglade and Chocreant, the fact that every inflammation of the meninges is associated with emigration of formed elements of the blood into the cerebro-spinal fluid.

Contributions to the Prognosis of Malignant Tumors of the Chorioid.

HIRSCHBERG, S., Berlin. (*Berl. Klin. Woch.*, 1904, Nos. 4 and 5.) The chief danger from sarcoma of the chorioid lies not in local relapses but in the formation of metastases, especially in the liver. H. reviews the statistics, with regard to this, from literature and of 68 cases, observed by him from 1872 to 1903. In the first 2 decennia of life the disease did not occur. From the 3rd to the 8th decennia, its frequency increases regularly, considered in proportion with the average number of men in the different periods of life. Death from metastasis, chiefly of the liver, was ascertained in 16, probable in 1. It occurred 1 year after enucleation 7 times, 1 and 1/2 to 1 and 3/4 years 5 times, 2 years 1, 4 years 1, above 7 years 1, after 9 years 1. Leaving aside, out of the 36 cured, 13 who remained well during the first 3 years, 23 cases apparently were permanently cured. Not counting 14 cases, from which H. received no further reports, and the 13, remaining well during

the first 3 years, 41 cases of sufficiently long observation were left. Of these 41, 1 died from relapse (2.5 per cent.), 17 from metastasis (41.5 per cent.), 22 stayed well (56 per cent.) This is the most favorable percentage, so far published. Sixty per cent. of the operations were performed in the first stage, viz., of lacking irritations, 20 per cent. in the second increase of tension and inflammation, 10 per cent. in the 3rd, spreading of the tumor beyond the eyeball. The clinical history and autopsy report of a patient who died 9 years after enucleation from metastasis of the liver, pancreas and heart, are given in detail. His conclusions is that as soon as the diagnosis of sarcoma of the chorioid is ascertained, the eyeball must be enucleated.

On Concomitant Movement of Paralysed Ocular Muscles.

WESTPHAL, A., Greifswald. (*Berl. Klin. Woch.*, 1904, No. 8.) W. describes in detail a case of alcoholic psychosis with concomitant movements of orbicularis palpebrarum and muscles, innervated by the 3rd nerve. The muscles, moving the eyeballs upward, were completely paralysed. On intended closure of the lids, which however was prevented by holding the lids apart, the eyeballs at once moved upward, with a simultaneous intense contraction of the pupils which otherwise reacted very slightly and very sluggishly to light.

A Case of Amyloid Degeneration of the Conjunctiva and Tarsus in a Malay.

STEINER L., Soerabaya, Java. (*Centralblatt* for Aug., 1904, p. 34.) In a man, affected with trachoma, both upper lids were enormously thickened, and overhung the lower ones, and could not be raised spontaneously, nor everted, on account of their weight. There was some muco-purulent secretion, but no swelling of the preauricular or cervical glands.

Through an incision of the skin, 3 mm. above the right lid border, the whole tumor was extirpated, excepting the deepest layer, adherent to the conjunctiva. On the left eye, the ulcerated conjunctiva was also removed and was supplanted by a plastic operation. Both eyes healed without relapse; the tumor was 3.5 cm. long, 2 cm. wide and 1.6 cm. thick and consisted of irregular hyaloid masses of homogeneous waxy appearance, giving amyloid reaction with iodide of potash and sulfuric acid, iodine green (1:150), and methylviolet (1 per

cent.). Besides infiltration with round cells, there were also giant cells which, in some places, seemed to have absorbed the amyloid substance, in others to have degenerated into amyloid. On other places, the amyloid appeared in form of swollen fibers, so that A. thinks it probable that the amyloid developed in the cells and the connective tissue fibers. The unusual feature in this case was that the entire tarsus was converted into amyloid, which so far has been encountered only in the conjunctiva.

The Mechanical Treatment of the Trachomatous Conjunctiva.

KIERNIK, L., Lodz, Russia. (*Ibidem* p. 40.) K. moves a glass rod, terminating in a glass globe, introduced into the upper and lower fornices, in a horizontal direction forth and back, pressing the latter against the orbital margins. K. claims as the chief advantage of his method, that it can be done by the patient or his relatives. His results on 150 patients and himself were better than with any other method. The mechanical treatment removes also argyrosis of the conjunctiva.

Violet Aniline Staining of Conjunctiva and Cornea, Removed With Peroxide of Hydrogen.

BRAUM, E. Darmstadt. (*Ibidem*). The broken part of a violet pencil had entered the conjunctival sac, staining corneal conjunctiva and lid borders intensely violet. $V=2/3$. Repeated instillations of peroxide of hydrogen removed the staining with $V = 1$.

Contribution to Purulent Tenonitis.

PURTSCHER, Klagenfurt. (*Ibid.*, p. 65.) P's case exhibited neither chemosis nor protusion nor ptosis, but total immobility of the globe, optic neuritis and moderate venous congestion in the anterior segment of the eyeball. On the 12th day, a few drops of pus were evacuated from a subconjunctival pus vesicle which had formed at the region of the insertion of the external rectus muscle. But recovery did not commence until a second small abscess at the same point was opened after 5 weeks. The prognosis was favorable since uvea and vitreous remained intact. Purulent tenonitis is almost exceptionally due to metastasis. In this case it may however have been caused by direct propagation from

a fistula of the upper maxilla remaining after extraction of a carious tooth. In analogy with metastatic inflammations of the joints, P. assumes here a primary affection of Tenon's capsule.

Forceps for the Removal of Pterygium.

NOISZEWSKI, K., Dunaburg. (*Ibid.*, p. 73.) The pterygium is grasped with N.'s broad tooth forceps as closely as possible to the cornea and is very slowly torn from the latter, so that its roots are also removed from the parenchyma of the cornea.

Then the pterygium is cut off, 1 to 2 mm. from the corneal margin. N. had very good results with this method.

On the Origin of Hyaline Bodies in the Optic Nerve.

STREIFF, J. J., 1st assistant at the eye clinic of Prof. Haab, Zurich. (*Klin. Mon. f. Aug.*, 1904, p. 149.) A. reports 6 cases, in which optic neuritis was the most probable cause of the development of hyaline bodies. In his opinion they are analogous to the lamellated concretions of the dural sheath and of the dura mater, and must be considered as a result of disturbances of the formation or circulation of lymph in the optic nerve. Although the histogenesis of hyaline bodies of the optic nerve is, according to investigations of Cirincione, entirely different from the hyaline bodies of the lamina vitrea, there is a certain etiological connection between both, since both are pathological formations in the nervous portion of the eye, the projections of the brain. In degenerative alterations of this portion, the hyaline bodies of the hyaloid membrane seem to predominate (retinitis pigmentosa senescence) while in inflammatory processes, the mechanical conditions at the lamina cribrosa are favorable to the development of hyaline bodies of the optic nerve. S's article is very well written with thorough utilization of literature.

Is Corneal Astigmatism Hereditary?

SPENGLER, E., Hildesheim. (*Ibid.* p. 164.) S's table of the curvatures of the Corneae of 5 succeeding generations was commenced by De Wecker and continued by S. in the laboratory of Dr. Javal, Paris. It shows that not only astigmatism itself, but also its kind, position of axis, and degree may be inherited.

Contribution to Melanosis Corneae.

YAMAGUCHI, H., Tokio, Japan. (*Ibidem*, p. 117.) Primary melanosis of the cornea is very rare and, so far, has not been examined anatomically. Y. gives the microscopic description of 2 pigs' eyes which exhibited an intense pigmentation of the central portions of the otherwise transparent corneae. The pigment was exclusively localized in the epithelial layer, chiefly the basal cells, since, by the negative reaction to iron, the hematogenous origin of the pigment could be excluded. Y. assumes a metabolic formation of pigment from the albuminoid bodies of the cells. The corneal epithelia acquired exceptionally the specific faculty of the cells to produce and accumulate pigment which is congenitally inherent to the epithelia of the limbus.

Pterygium and Pseudopterygium of the Upper Lid.

WERNECKE, TH., Odessa. (*Ibidem*, p. 126.) W. describes a rare case of pterygium of the upper lid in a boy, aged 12 years, which he attributes, with other authors, to a congenital formation. In another case the head of the pterygium had developed from a place on the upper lid where an hordeolum had broken through. Here it apparently was caused by the concrescence of a fold of the swelled conjunctiva with that point. Both surfaces had epithelium and were otherwise not attached.

On Conjunctival Cysts.

ISCHREYT, G., Libau, Russia. (*Ibidem*, p. 122.) I. describes two cases examined microscopically. In the first, the cyst most probably developed from a gland of Krause in the fornix of the lower lid, and was a retention cyst. In the second case it was impossible to ascertain whether it had formed from a gland of Henle in the fornix of the lower lid, or from a catarrhal proliferation of the epithelium of the conjunctiva by agglutination of some recesses.

A Case of Glaucoma With Total Atrophy of the Iris by Traumatic Hemophthalmus.

STOEWER, Dr., Witten. (*Ibidem*, p. 143.) A contusion of the eyeball led to hyphemia and hemorrhages of the vitreous. The subsequent glaucoma is ascribed to arrested fil-

tration from the sinus of the anterior chamber by the swelling of the ciliary body through hemorrhages. Very unusual was the rapid development of atrophy of the iris within two and one-half weeks, which perhaps was due to interruption of the blood circulation of the iris, caused by the hemorrhagic swelling of the ciliary body.

Contribution to Osteoma of the Orbit.

BIRCH-HIRSCHFELD, A. (*Ibidem*, p. 213.) B. reports a case of osteoma of the frontal sinus in which the differential diagnosis from exostosis of the orbit was made by examination with Roentgen rays. The tumor was exposed by osteoplastic reflexion of a skin-bone flap of the forehead and was extirpated, with recovery in three weeks.

Then follows a review on the occurrence, etiology and structure of osteoma of the orbit and operative methods. For the latter, B. emphasizes the great importance of the examination of the bony tumors of the orbit with Roentgen rays.

Latent Osteoma and Mucocoele of the Frontal Sinus With Negative Rhinoscopic Findings in the Frontal Sinus.

AXENFELD, TH., Freiburg. (*Ibidem*, p. 229.) Referring to the foregoing article of Birch-Hirschfeld, A. reports a case of osteoma of the frontal sinus, operated on by him, in which the examination with Roentgen rays had been omitted, but would undoubtedly have led to a correct diagnosis. The case was of especial interest, as the osteoma was concealed from the orbit by a mucocoele, and probing from the nose had revealed an apparently intact frontal sinus. The osteoma must have developed, either from an accessory frontal sinus or from a projecting septum, and thus had led to a partition of the frontal sinus.

On Affections of the Eye in Acanthosis Nigricans.

BIRCH-HIRSCHFELD and KRAFT, O. (*Ibidem*, p. 232.) Acanthosis nigricans, or dystrophia papillaris et pigmentosa is a skin disease, characterized by its localization, hypertrophy of the papillae, and abnormal pigmentation. The lids are frequently, the conjunctiva rarely, involved. The authors describe a case (with photograph) in which the lid margin of all the lids showed reddish excrescences of the

size of a pin's head to 5 mm. They were especially large near the tear points and resembled in form and size a raspberry. The conjunctiva was not affected, only at the right lower lid it exhibited a velvetysurface from a simple papillar hypertrophy. The excrescences were excised, to the great relief of the patient, but after a few weeks new papillae developed in the scars, without causing any annoyance so far.

On the Refraction of the New-Born.

ELSCHNIG, PROF., Wien. (*Zeitschrift für Augenheilkunde*, XI., p. 10.) E. frequently found (by sciascopy and with the ophthalmoscope) in the newborn from two hours to two days after birth, myopic refraction between 4 and 7 D. After instillation of atropine the accommodative myopia disappeared and hypermetropia was ascertained. E. attributes the accommodation to inappropriate involuntary innervations at the first visual attempts.

On the Utilization of Cataphoresis in the Local Treatment of Luetic Eye Diseases.

KRUCKMANN, E. PROF., Leipzig. (*Zeitschr. f. Aug.* p.13.) Cataphoresis, i. e., the method to introduce drugs through the intact skin by means of electricity, was most exhaustively studied by A. Meissner, *Arch. f. Phys.*, 1899, p. 11. K. describes his experiment on rabbits and his clinical results with solutions of sublamin 1: 3000, and mercury succinimide 1: 4000, brought into the eyes of 28 luetic patients by means of cataphoresis. Fourteen showed papulous changes, 4 tuberos nodules and 2 fibrinous iritis, 2 gummata of the ciliary body and 2 of the chorioid. All were cured by this method alone. Its value lies in a quick but transient action so that general anti-syphilitic treatment is required under all circumstances. Its application will be successful, 1st. In rapidly developing tuberos syphilides and early gummata, producing episcleritis; 2nd. In obstinate and relapsing inflammations, if the body is saturated with mercury; 3rd. For diagnostic purposes in doubtful cases, since it causes, like tuberculine, local reactions; 4th. For a more speedy cure, and 5th. In mercurial stomatitis.

The method and apparatus are minutely described and must be read in the original.

Muscular Paralysis Preventing the Winking and Closing of the Lids, and on the Conduction of the Tears.

SCHIRMER, O. PROF., Greifswald. (*Zeitschr. f. Aug.*, 1904, p. 97.) S. reports three cases of incomplete paralysis of the orbicularis muscle, which confirmed his theory that the only essential factor in conveying the tears into the tear sac is the winking of the lids and the consecutive passive extension of the tear sac, not gravity, capillary attraction, aspiration from the nose, nor closure of the lids. In his cases the ciliary portion of the orbicularis, Horner's muscle, was paralyzed, which affects the winking of the lids, and thus extends the tear sac so that the latter can aspire the tears aided by independent movements of the canaliculi.

On Heterophthalmus.

WEILL, GEO., Strassburg. (*Zeitschr. f. Aug.*, 1904, p. 165.) From seven cases reported in detail W. reached the conclusion that in heterophthalmus the light-colored eye most frequently suffers from chronic uveitis, very often followed by cataract. The lack of pigment is not the cause, but the consequence of the eye disease. In heterophthalmus very likely disturbances of circulation exist, during embryonic life, at least previously to the formation of the iris pigment, which, after having been latent for many years, may later on again become manifest in the form of cataract and iridocyclitis.

Guide to Clinical Investigations on the Serum Treatment of Serpent Ulcer.

RÖMER, PAUL, Würzburg. (*Zeitschr. f. Aug.*, 1904, p. 193.) In this instructive and interesting essay the author, whose investigations with regard to the serum therapy of serpent ulcer are well known, discusses the general principles of the mode of treatment and the tasks which still have to be solved.

On Relapsing Alternating Paralysis of the Third Nerve.

KOSTER, W. PROF., Leiden. (*Zeitschr. f. Aug.*, 1904, p. 209.) K. reports in detail a case of relapsing paralysis of the third nerve, most likely nuclear, associated with paralysis of the fourth nerve as an initial symptom of locomotor ataxia.

Pseudo-neuritis Optica, Edema of the Disc, Neuritis Optica.

PICK, L., Königsberg (*Zeitschr. f. Aug.*, 1904, 221.) In hypermetropia and hypermetropic astigmatism, the optic disc occasionally may show a resemblance to optic neuritis, which may be increased by a combination with tortuosity of the vessels or by hyperemia of the disc in febrile conditions. The difference consists in the constant presence of hypermetropia, the conditions of the blood vessels which, in pseudo-neuritis, show no abnormalities in their course, reflexes, pulsations, the minimal or absent prominence of the disc, the lack of small, grey foci and hemorrhages in the retina. P. found six such cases in about 7,000.

Edema of the disc may occur in various forms of anemia, primary or secondary, as in nephritis, carcinomatous cachexia, very rarely in chlorosis. It is due to a certain imbibition of the tissue of the disc, without essential visual disturbances and disappears with the improvement of the general diseases. It is of great prognostic significance, as in nephritis, e. g., it indicates only a temporary impairment, while optic neuritis is an ominous symptom.

Some Rare Forms of Glaucoma.

SALA, Rostock. (*Klin. Mon. für Augenh.* 1904, p. 316. S. observes an attack of acute glaucoma 6 hours after discission of a soft cataract in each eye of an idiopathic child, with recovery after paracentesis. In two other cases, acute glaucoma followed severe contusions of the eyeballs and was also cured by paracentesis. In all, the aqueous contained large quantities of albuminous matter, to which S. attributes the pathogenesis of glaucoma, by interfering with the filtration through the sinus of the anterior chamber.

On the Pathogenesis of Amoebic Chorioiditis after Iridectomy in Glaucoma, and on Corpora Amylacea in the Excavated Disc.

- DEMARIA, B., Freiburg. (*Klin. Mon. für Aug.*, 1904, p.) 339.) The anatomical examination, given in detail, showed a direct communication of the anterior chamber with the canal of Schlemm and the perichorioidial space, which explained the detachment of the chorioid. The rupture involved the insertion of the iris, separated the ligamentum

pectinatum from the ciliary body, opposite the artificial coloboma, and perhaps was caused by outer pressure. A predisposition was apparently given by the glaucomatous and senile atrophic condition. The excavation of the atrophic optic nerve was filled with about 70 corpora amylacea, of various sizes up to 20 mikrons, showing concentric structure and, by their characteristic chemical reaction, were distinguished from hyaloid bodies. On account of their contents of iron in this case, D. classes them under hemorrhagic products.

Anatomical Description of two Eyes Operated on for Staphyloma of the Cornea.

YAMAGUCHI, H., Tokio. (*Klin. Mon. f. Aug.*, 1904, p. 353.) Y. gives the anatomical description of two eyeballs, very recently operated on for staphyloma, one with, the other without sutures. They showed slight injuries of the ciliary body by the knife, which must be carefully avoided, on account of the danger of sympathetic ophthalmia, necrosis of the wound edges in both cases, intraocular hemorrhages from the retina and chorioid, from the sudden change of intraocular tension. The cases show that neither method excludes complications of wound healing.

Can a Spontaneous Reattachment of a Detached Iris Take Place?

WICHERKIEWICZ, B. PROF. Krakau. (*Klin. Mon. f. Aug.*, 1904, p. 363.) The observation of two cases enabled W. to answer this question in the affirmative. The chief element was the exclusion of an active movement of the iris by atropine mydriasis, aided, in the first case, by the dislocated lens pressing the iris against the place of dialysis from the ciliary body; in the second by the protruding vitreous.

On Radium Rays and their Action on Normal and Blind Eyes.

GREEFF, PROF., Berlin. (*Deutsche Med. Woch.*, 1904, p. 452.) G. communicates experiments with radium he undertook at the instance of the government to criticize the article of Prof. London at St. Petersburg entitled: "A hope for the blind", that had appeared in Vienna political papers. Radium has two kinds of luminous actions, first a kind of fluorescence in other objects and second the regular radium rays. Paper,

impregnated with baryum-platinum-cyanide, is especially adapted, to show this fluorescence, after being approached to radium. But the light, emanating from this paper, is common light, not radium light, and is intercepted by all opaque objects.

The direct action of the radium rays on the eye is entirely different. After adaptation of the retina to absolute darkness, it perceived, at a distance of 10 cm. from 0,02 radium, enclosed in a leather pocket, a diffuse green, intense shine. These rays could not be projected by the eye, i. e., it was not possible to say, whether they came from above, below, right or left, since they penetrate all tissues of the eye from all sides, no matter whether the radium was held on the side, on the forehead, or temple over the bone, whether the eye was closed or covered by the hand or by any opaque object. Even the bones of the hand could not be perceived as shadows. The radium rays penetrate all objects we know, and in this differ from the X rays and in that they can be perceived by the eye at once, X rays only after certain preparations. The action of radium on the eye is explained by Himstedt and Nagel by fluorescence of lens and vitreous perceived by the retina. G. ascertained this fluorescence in the isolated cornea, lens, vitreous and retina of fresh pigs' eyes. The chief point is however that radium does not bleach retinas, containing visual purple in the dark, so that a direct action of light on the retina can be excluded. G's experiments had no detrimental influence on the skin or eyes.

The patients of Prof. London were not amaurotic, i. e., the cones and rods of the retina must have been preserved, otherwise no perception of light could have taken place. They saw shadows of opaque objects, held before a screen of barium-platinum-cyanide, which had become fluorescent by radium. The same would have been obtained if the object had been held before a translucent screen, illuminated by a kerosene oil lamp. Experiments showed that these opaque objects could not be differentiated in direct radium rays, since they were also penetrated by the latter. If the entrance of light into the eye, with normal retina, is prevented by opacities of the anterior segment, the latter can be penetrated by X-rays and radium rays. But these rays are not refrangible. Even if the lens is well preserved, the radium rays with pictures of the outer world are not focused to small pictures on the retina, but pass in a straight direction unimpeded through the eye and the hand, and create only a diffuse perception of light through fluorescence, nothing else. Therefore the hopes for the blind from radium, aroused by Prof. London, are null and void.

**ABSTRACTS FROM DUTCH OPHTHALMIC
LITERATURE.**

BY

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ASSISTED BY

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Quarter ending June 30, 1904.

**Twenty-Fourth Meeting of the Ophthalmological Society of the
Netherlands, held December Twenty, Nineteen Hundred
and Three.**

Dr. Schoute announced that he with Dr. DeVries in conjunction with Prof. Straub proposed to investigate the heredity of refractive errors especially among students.

Dr. Lans exhibited a patient, female, with bilateral central corneal fistulae. Patient now 44 years of age. When two and a half years old she was vaccinated with human virus. Following this occurred a general dermatitis attacking especially the face and complicated by a bilateral ocular inflammation which was very tardy in recovering. At 3 years of age she was examined by Prof. Donders who reports:

O. D. S. cicatrix corneae.

O. D. Synech, anterior inferior M, $1/5$ V. = $4/20$.

O. S. Synechia anterior externus.

O. D. S. T. = N.

O. D. Pupil irresponsive to light stimulus.

O. S. Pupil responds to light stimulus.

July 3, 1867, Dr. Snellen iridectomized right eye upward. Ten years later, 1877, vision in each eye $4/36$. Prof. Snellen iridectomized O. S. upward.

From 1877 to 1900, the eyes remained comfortable except for a slight conjunctivitis.

In November she reported right eye painful, conjunctiva congested, slight ciliary congestion. Center of cornea presents slight elevation, a bleb the size of a pin's head and filled with transparent fluid. Pressure on eye painful. Anterior chamber deep, media clear. Tn +.

The bleb was incised by Prof. Snellen liberating a small quantity of clear fluid; the anterior chamber became shallower, tension returned to normal, the eye was then closed with a compress bandage. The eye remains quiescent as was seen at the time of exhibition of patient. The tension is now reduced, the anterior chamber is normal in depth and vision registers:

V. O. S. S. —8 \odot cyl.—2 ax, 190 = 2/36.

V. O. D. S.—8. \odot cyl,—2. ax, 180 = 2/24.

(Dr. Lans gives a lengthy dissertation as to the probable infection from the human virus employed. He also gives tables showing percentage of ocular involvement before vaccination and afterward in the various countries and cities of Europe.)

Dr. J. F. X. Hamer reports a case of carcinoma of the inferior lid treated by the x-rays:—

Female age 56 years. In 1867 she had a violent inflammation of the left eye leaving a dense opacity of the cornea and a small swelling in the lower lid. The eye remained quiet until 1900 when the swelling in the lid began gradually to increase. Complete removal of the entire lid was advised but declined. By November 10, 1901, the entire ciliary margin of lid was thickened, the skin looks normal, cilia all lost. At the apex of swelling exists a minute elevation. The eyeball is injected.

Microscopical examinations confirmed the diagnosis of carcinoma.

November, 1901, she was seen in consultation with Dr. Meindersma who advised immediate total removal of the lower lid. Notwithstanding the advice given, after much thought, the lid was subjected to x-ray treatment resulting in complete cure.

Case II. Miss A. P. consulted me on March 26, 1901. Besides a slight conjunctival inflammation she has had a large ulcerating epithelioma on the right side of the nose

which has existed for two and a half years. She has been treated by the usual methods without result. After 32 x-ray exposures the ulcer was entirely healed, and the surface was covered by normal derma without resultant scar.

The first use of x-ray treatment in Holland was made by Prof. Wertheim Salomonson beginning December 22, 1901, and continuing until the end of June, 1901. During this time the patient received 50 treatments. In August, 1902, Prof. S. declared the patient cured and at this date, one and a half years since treatment, it remains so.

Dr. Lans observes that the corneal opacity, which had existed for thirty-four years, has since the x-ray treatment very much cleared up. December 28, 1891, V. O. S. was 4/18, on December 20, 1903, it was 6/18.

Discussion. Dr. Piekema remarked that he knew of similar cases, also cases of lupus that had received x-ray treatment and were apparently cured but which relapsed later.

Prof. Snellen, Jr., has made the same observations and has had experiences and results similar to those reported by Dr. Piekema. S. remarked that it is true that the skin wound heals but the disease progresses in the depths of the tissues to make its appearance later upon the surface.

Dr. Van Guens exhibited an acetylene lamp to be used during discission, especially after cataract. He gives a lengthy description of the lamp and its utility.

Prof. Koster also exhibited an acetylene lamp devised by him, expressing preference for this form of illuminant over electric light since the latter is very uncertain and may be extinguished at the most critical moment.

Prof. W. Koster exhibited a series of test types devised by himself for the determination of the visual power of myopes at the p. r. They consist of a series of very small optotypes reduced by photographic methods from a set of test letters. They consist of three groups. To the left are triangular figures, in the center are letters and to the right numbers. The reason for selecting these special forms of types will be given in another paper to be published later. At this time the speaker dwells only on the determination of vision in myopia without correcting glasses. The test types include 13 different sizes so selected that they can be read by myopes of 1, 1.5, 2., 3., 4., 5., 6., 7., 8, 9., 10, 11, 12, 14, 16, 18, and 20 D. at the p. r. when they still possess normal

visual acuity—when they can still read a letter at an angle of 5 minutes. The height of the test letters appear in reversed ratio—order—to the numbers of the dioptries, 0.75, 1, 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10, and are printed next to them. Besides, there are printed the numbers indicating the distance of the p. r. from the cornea.

If now a patient has diminished visual acuity, if, for instance, a myope of 25 D. reads at 5cm. only the line of letters which a myope of 8 D. having normal v. a. should read, then he is said to have $V = 8/20$, if now he reads at once the proportional numbers then $V. = 4/10$, if he can read only the line for M. 4D. then V is said to equal $2/20$; or he has a lower grade of M.—12D.—and can scarcely read the line for M. 6D. then his V would be expressed by the quotient of the proportional numbers— $3/6$. For cases with stronger M. than 20 D. no further test types are available, even should they have normal vision which in practice is never found and so the test types may be made to serve to test even higher grades of M. Given a patient with a M. of 40 and who still possesses one half of his visual acuity, he should still be able to read the 20 D. line at 25 mm. from the cornea. It is to be observed that by the use of these test types any grade of myopia can be measured without the use of correcting lenses, a very desirable and important consideration. The test types are photographed on glass, fixed in a firm frame which is attached to a handle, and the reading is done against a bright back ground, preferably a clear sky. The distance from the frame to the eye is indicated by a marked bar attached to the frame.

Should the examining surgeon have diminished v. a. preventing him from reading the smaller types, a series of types on a larger scale is employed, thus enabling him not only to follow the patient but controlling the examination. This series of letters is designated as "Table No. II," while another series to be employed in cases of very weak myopia as "Table No. I." These should be read at a distance of 25 cm. when V is notated in tenths of the number opposite the line read.

Visual acuity may be determined at any desired distance when the number printed opposite the line read is given and not as above in tenths. It is to be observed that at a dis-

tance of 50 cm. a v. a. may be found of $2/5$, $3/5$, & also of $6/5$, $7/5$ &.

Dr. Schouten exhibited an instrument for the determination of the visual acuity at the p. r. in myopes in which the test types printed on a board fixed upon a sliding bar are moved to and fro before the eye.

Dr. DeVries exhibited preparations of an eye which eleven years before had been subjected to a reclinacion of the cataractous lens. The operation was followed by glaucoma, perforating ulcer of the cornea and extensive subchorioidal hemorrhage.

Discussion. Dr. Faber asks if it is justifiable to ascribe all of the inflammatory conditions following a reclinacion to the operation. He calls attention to the difficulty experienced to maintain the luxated lens in its place. In an operation performed on a dog the luxated lens was seen to reappear in the pupil two months afterward.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

J. GUTTMANN, M. D.,

NEW YORK.

Quarter ending June 30, 1904.

A New Treatment of Trachoma.

NIEMTSCHENKOW, Dr. (*Wiener Medizinische Presse*, January 17, 1904.) The author injects, with a thin Pravaz syringe, 0.25 of a 5 per cent. carbolic acid solution under the conjunctiva of the lid. First under the lower, and then under the upper lid. Severe pain which follows the injection disappears after a few minutes. The reactionary inflammation is very severe but diminishes gradually and after 10-14 days disappears entirely. The follicles are absorbed by the hyperemic tissue. It never became necessary to repeat the injection more than three times.

The Use of Aspirin in Ophthalmic Practice.

NEUSTAETTER, O., DR. (*Wiener Medizinische Presse*, Feb. 14, 1904.) In the treatment of diseases of the eye, aspirin has 3 important properties: diaphoretic, specific and anodyne. Its antipyretic property need not be considered in ophthalmic therapy.

The author employs aspirin as a diaphoretic in all acute and chronic inflammatory affections of the interior of the eye in doses 0.5 to 1.5 g. rarely 2.0 g. As a specific he recommends it in rheumatism and gonorrheal affections of the eye, but rarely in conjunctivitis. The anodyne effect of the drug was recognized also by Weil, Witthauer, Dengel, Valentin, Goldberg, and plays an important role in the treatment of the subjective symptoms. In one instance only could the author observe an antipyretic effect.

The writer concludes by saying that all in all aspirin is an excellent preparation that possesses the therapeutic effects of salicylate of soda, but surpasses that drug by having no untoward effects and by having a much more pleasant taste.

Exophthalmus and Brain Pressure.

GERMANUS FLATAU, DR. (*Wiener Medizinische Presse*. Mar 6, 1904.) The author reports 15 cases where exophthalmus was observed in cerebral disease with increasing intracranial pressure. The number of reported cases is so small that it might be concluded that the condition is a very rare one. In the cases reported the occurrence of exophthalmus does not seem to have been carefully observed, and in many cases seems to have been overlooked altogether, particularly so when the exophthalmus was not very marked and when the patient had not been seen before the development of the disease. As an example of this he cites a case of brain tumor with marked hydrocephalus; in this case aside from a choked disc nothing abnormal, certainly no exophthalmus was observed. In the course of treatment, after general improvement and diminution of brain pressure had set in, the author observed that the eyeballs became smaller, so that it became doubtful, whether there really was not slight exophthalmus at the height of the disease.

In order not to overlook such mild cases of exophthalmus in these cases, the author recommends in all cases with increased intracranial pressure to undertake regular exophthalmometric measurements both before and after lumbar puncture.

As far as the causation of the exophthalmus is concerned, the author believes that when one considers the nervous influences, the influence of the sympathetic, the centre in the course of the sympathetic which regulates the retrobulbar blood quantity, he must ascribe the exophthalmus to disturbances in circulation in the venous sinus of the brain. These disturbances in circulation are not caused by the pathologically increased pressure alone except in occasional cases of extreme intracranial rise in pressure. In almost every case there is a direct disturbance of circulation which may be caused by pressure of a swelling, or abscess, or of an internal hydrocephalus. If the anastomosis between the orbital and facial veins is sufficient exophthalmus as a rule is absent.

The Present Status of the Operative Treatment of Myopia.

EMIL LEVI, DR. (*Wiener Klinisch-therapeutische Wochenschrift*, Feb. 28.) Although the operation has been practised by different oculists, ever since Fukala described his first operation 16 years ago, the results and methods have been so diverse, that there still remain many problems to be solved.

The degree of myopia for which the operation is indicated is a question upon which all operators do not agree. Gelpke, one of the first and most ardent advocates of the operation operates down to 10 D; as a rule 15 D is today considered the minimum except in very young individuals. The author says that he is happy to see that the time, when the operation was performed down to 2 D as Moore practised it, has passed. He says that as a rule it is best only to operate when the refraction after the operation will improve the patient's sight for his special purposes.

The writer then gives Hirschberg's formula of calculating the post operative refraction,

$$R = 10 - \frac{R'}{2}$$

which is that the post operative refraction equals to 10 D minus one half the anteoperative refraction, so that a myopia of 20 D becomes after operation E. This formula, he says, applies only when the form and refraction of the refracting media correspond approximately to the average; the only exception to this being the occasional refraction of the cornea, which can be determined very easily with the Javal-Schiötz ophthalmometer.

According to Pflüger the following relation exists between the refraction of the cornea and the post-operative refraction.

1. To corneal refraction of 41 - 42 D Hirschberg's formula is applicable, i. e., 20 D M becomes E.

2. To every additional corneal refraction of 1-2 D the myopia diminishes 1 D and vice versa, so that for example with a 46 D corneal refraction 17 D is already E. With these rules no error can be made provided the refraction before the operation has been accurately calculated, and for this purpose it is important that numerous examinations under atropin be made, and the astigmatism be properly corrected.

As far as the desired minimum acuity of vision is concerned, Pflüger and others operate upon patients who after correc-

tion could see fingers only 3-4 m. and these are the most grateful patients. The improvement of acuity of vision according to Fukala, Schauz and Leber depends on the different sizes of the retina before and after the operation. Bjerke laid down the following rule: If the correction glasses are in front of the cornea 15 mm., as they usually are, we must add or subtract 2 per cent. for every D accordingly, whether the glasses are concave or convex, so that the acuity of vision of the "complete" eye equals that of the eye without the lens.

Whether the operation really has the curative effect upon the membranes of the eye that cause the myopia is still a mooted question. Gelpke is very optimistic in this respect. Senn after careful observation says that the changes in the background of the eye were improved after the operation; but v. Hippel reports that out of 184 cases in 5 the operation was not successful because a central chorioiditis followed. Fukala erroneously considered the usual myopic changes of recent occurrence, absolute contraindications to the operation, whereas Pflüger, Otto, and Vacher intentionally operated upon cases with recent chorioiditis with good results.

The age of the patient plays no role in considering the advisability of operation. Fukala was of the opinion that 25 years was the maximum. V. Hippel operated upon a man 70 years old. Laqueur does not operate upon patients over 30 years of age but not for the same reasons as Fukala, who wanted to accomplish the desired result by single discission, but this ideal procedure can rarely be performed; usually several attacks must be made. Either discission had to be repeated or the swelling was so rapid, that slight change in pressure followed and puncture of the anterior chamber had to be resorted to within 3 - 8 days. This withdrawal of the inflamed masses of lens seems to be a normal procedure with Pflüger, who always practises it with Gelpke, who performed it in 83 per cent. of his cases. In 38.6 per cent. of the cases of this operator cataract followed which had to be removed during a third operation. Some operators remove this secondary cataract immediately (Sattler); others, Emmert particularly, postpone it as long as possible, and believe that by waiting long, may be able to dispense altogether with its removal.

The author does not enter into the different modifications

of the operation, because just as in the senile cataract operation, every oculist has his own method.

Fukala's method is entirely different from that which Vacher first brought to notice and later Hess and Sattler worked out thoroughly, and which consists in the so-called "primary extraction." This is naturally a more energetic procedure and undoubtedly requires more assistance and better training. The results in Sattler's clinic with this method were very satisfactory. The advantage of primary extraction is a shorter period of treatment than with Fukala's method, both as regards the time spent in the hospital and the time that the patients are able to enjoy the full benefits of the operation.

The author further goes on to say that the most successful method will be the one that will in the least obviate the most important danger of this operation—the detachment of the retina. After quoting statistics of *ablatio retinae* in the hands of the different operators, he says that this danger should not deter us from operating whenever it becomes necessary.

The performance of the operation on both eyes has been given up, or at least a long interval must elapse between the respective operations on the two eyes.

The operation is not absolutely without danger because aside from *ablatio retinae* iritis occurs sometimes through infection in spite of thorough asepsis. Gelpke had iritis in 5 per cent. and Sattler in 2 per cent. of the cases. The possibility of glaucoma following the operation must not be lost sight of.

The writer concludes the article by stating that in order to put the operation on a sound basis it is not necessary to report more new cases but to study the latter results of the cases already operated upon.

The Treatment of Granular Inflammation of the Eye.

PORT, DR. (*Wiener Klinisch-therapeutische Wochenschrift*, Feb. 28, 1904.) The author recommends the irrigation method by means of an apparatus fastened to a ring and suspended from a height of 100-120 cm. above the level of the eye; to this apparatus is attached a current regulating tube, the employment of which allows the hands of the operator to remain free, enabling him to turn the lids. He em-

plays a physiological salt solution and adds 1-2 gr bichloride of mercury to every 3 litres of the solution. The quantity is 420 cc. The current has the effect of massage on the trachoma granules; these at first show an increased redness and swelling which however diminish later.

This method the author states is milder than the expression or extraction method, and if not more, at least just as efficacious. Variations in temperature and chemical composition of solution are possible. The attending physician should always bear in mind the necessity of protecting his own eyes by means of glasses.

Bacteriological Investigation and its Significance in Operative Ophthalmic Therapy.

BACH, DR. (*Wiener Klinisch-therapeutische Wochenschrift*, Feb. 28, 1904.) The infections which are possible during an operation on the eye may arise from the air, the hands of the operator, from the eye drops which may be applied, from the margin of the lid, from the conjunctiva and from the instruments.

The infections from the air and hands, the writer says, are not as important as those arising from the eye drops; the sterility of these solutions is an essential factor. Abnormal margins of the lids and conjunctiva contain numerous bacteria which are quite often very virulent, so that, if possible no operative measures should be undertaken until such pathological conditions have been treated.

The writer is not in favor of washing the parts with sterile solutions, because absolute asepsis cannot be accomplished in this manner, and he is rather inclined to keep the operative field clear of bacteria, by mopping out the accumulated secretions from the conjunctival sac with small cotton pledgets. He also recommends to cleanse these parts mechanically by washing them carefully with neutral solutions.

Post-operative infection in the author's opinion seems rather to be the exception.

The instruments one would think could easily enough be sterilized, and still some errors happen in operative ophthalmological technique, which interfere with their being absolutely sterile. Bach considers the instruments as the most prolific cause of infection.

By eliminating these sources of error the author hopes to achieve good results.

"Latticed" Opacities of the Cornea.

HEINRICH FREUND, Dr. (*Wiener Klinisch-therapeutische Wochenschrift*, Feb. 28, 1904.) The author reports 15 cases of this very rare affection, which he himself had examined and observed for a long period. Until now there were only 10 cases of this disease reported in literature (Biber, Haab, Dimmer). The affection seemed to have been hereditary for several generations. The disease usually begins at puberty. Both eyes are involved, one however is usually more affected than the other.

For the first stage only a few single knotlike elevations in or around the centre of the cornea are observed; these correspond to the smallest light gray cloudy spots, which lie under the epithelium. Even at this stage a faint bluish gray cloudiness may be observed in the centre of the cornea, which when examined with a magnifying glass, will show a meshwork consisting of fine greyish blue knotty irregularly crossing lines; and it is from this grating-like appearance of the cloudiness that the disease derives its name. Alongside of these, however, mostly in the periphery, there are numerous radiating greyish lines thickly placed under the epithelium which by trans-illumination appear deep black.

Subjectively, besides a strong diminution in vision, there is a dryness of the eyes, and a troublesome dazzling appearance in front of the eyes. In the course of the disease all these appearances increase or diminish more or less, until about the 40th year, but the margins of the cornea always are spared. In some of the cases this picture remains stationary at this stage, in others there begin painful inflammatory phenomena. In these latter cases the epithelium over the knots degenerates; parts of the degenerated epithelium fall off with a consequent keratitis. Often only after a number of years do these inflammatory phenomena disappear, leaving more or less thick corneal cicatrization.

Anatomically there seem to be a (Duskuntildung) formation of gaps and hyaline degeneration of the cornea. As far as treatment was concerned the progress of the disease could not be checked by any measures, not even by abrasion of the cornea.

The condition must be differentiated from the knotty shaped cloudiness of the cornea described by Groenouw and Fuchs. The writer concludes the article by reciting the 3 distinctive features of the disease:

1. It consists of grayish superficial spots within and around the centre of the cornea; these latter become thick and elevate unevenly the surface of the cornea.
2. It consists of diffuse cloudiness of the cornea, which when examined with a magnifying glass seems to resolve itself into a grated like network.
3. The margins of the cornea are never affected.

The Treatment of Keratoconus.]

ELSCHNIG, PROF. (*Wiener Klinische Rundschau*, May 15, 1904). In 1894 the author had already advocated cauterization of the point of the conus with a slightly red galvanocautery as the safest and best treatment of this condition. By this method he was able to obtain flattening of the tip of the conus and improvement of vision after a single cauterization. If the tip of the conus is cauterized a flattening of the scar is also obtained which is almost always very tender, bluish in color, transparent and so yielding that, after a short interval, it becomes ectatic again, and on account of this, in the opinion of most authors, repeated cauterization at short intervals becomes necessary in order to obtain good results.

The author connects a deeply seated scab of the tip of the conus with the adjacent corneoscleral border by a broad band of superficially scabbed tissue. Before the scab of the point of the conus becomes detached, the small blood vessels from the corneoscleral border grow into the joining "bridge;" usually 3 weeks after the cauterization 2/3 of the scab is densely vascularized, the scar becomes denser and smaller, and the conus becomes flat. It takes about 2 months for the complete formation of the scar.

Cauterization is today generally considered the best method of treating keratoconus, but the author's method of connecting the scab of the tip of the conus with the corneoscleral border is not well accepted, although a diminution of vision from this procedure has never resulted, because the tip of the conus is as a rule situated eccentrically. If this be not the case we must endeavor to place the scar eccentrically in order to leave free a part of the pupil. Of all of the many

authors whom he cites, Czermak is the only one to endorse this method.

The author now goes on to cite the histories of the two cases in which this method of treatment proved very satisfactory.

He concludes the article by stating that, in his experience, cauterization reduces the abnormal convexity of the cornea to a normal condition only in slight cases; in cases where the ectasia is of a higher degree this cannot be accomplished. It is not necessary to strive for this, as in all cases it is amply sufficient to decrease the convexity and by a dense scar to eliminate the most disturbing part of the tip of the conus, because by this the vision is improved and the progress of the ectatic process is checked.

The performance of an optical iridectomy after the scar formation, he does not approve of, as the sight is always diminished after such a procedure. Should the scar become quite large, he uses atropin to improve the vision. He cautions to avoid perforation of the cornea by cauterization.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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ASSISTED BY

CLARENCE VAN EPPS, M. D.,

DAVENPORT, IOWA.

Quarter Ending June 30, 1904.

Ocular Lesions Caused by Lightning.

GONIN, Lausanne. (*Annales d'Oculistique*, February, 1904.) Gonin reports two cases of ocular lesions which followed exposure to lightning. The first was seen in a 34-year-old man, who was awakened at night by a severe electric storm with the burning of a near-by building. The following morning the patient found himself almost completely blind in the right eye, "becoming absolutely so" in three days' time. Examination at this time revealed the presence of dilation of the right pupil, with an absence of all corresponding iris reactions except those which were consensual. The optic disc was pale and the retinal arteries were moderately contracted.

Two years later the disc showed white atrophy and the retinal vessels were slightly contracted. Vision was reduced to one-twelfth of normal, and there was a relative scotoma which reached to 35 degrees in all directions.

The second case was that of a 26-year-old man, who was sitting at a table, above which there was an electric light wire, which came from without the room. The wire was struck by lightning. The patient, who was leaning upon his left elbow, was rendered unconscious for a period of fifteen

minutes. After recovering, he found that he was blind in the left eye, and that he was barely able to tell light from darkness with the aid of the right eye. His face and eyelids were swollen, and there was an irregular linear burn in the left forearm. Four days later the swelling on the face had almost disappeared, but there remained a slight chemosis of the two eyes. Vision had gradually improved, and was equal in the right eye to one-tenth of the normal and in the left eye to one-twentieth of the normal. There was a marked ciliary injection with lacrimation. The pupils were contracted and the irides reacted poorly. On each side there was a diffuse corneal haze which prevented an examination of the eye-grounds. A week after the accident, the corneal haze had disappeared, revealing the presence of a stellate opacity in the posterior crystalline cortex in the left eye.

Three months later, the lenticular trouble began to disappear in the left eye, to appear as a stellate opacity in the anterior cortex of the right lens. Four months after the accident, the lenticular lesions remained the same; the optic discs were pale, and the retinal arteries were contracted. Vision with the right eye equalled one-half of the normal, while that of the left eye was one-sixth.

The author has collected twenty-one similar cases in which lesions of the crystalline lens have followed exposure to lightning.

In nineteen in which the conditions are definite, one eye was affected in eight cases, and both eyes in eleven. Only two cases are reported in which the crystalline lenses were not affected. The lenticular changes, the author says, may develop in two to three days' time, or may appear as late as three years. Affections of the optic nerves, he has found, are reported in eight instances: they may be unilateral, and usually are late complications. A few cases of probable retinal hemorrhage have been noted, while one case of chorioidal rupture with retinal detachment has been seen.

After a discussion of the experimental work which has been done upon the subject, the author closes his paper with the following conclusions: I. The ocular lesions caused by the direct action of lightning upon the tissues of the eye, differ from those which simply result from the luminous action of lightning or of an electric spark. II In the great

majority of cases the only symptoms which are common to these two accidents are conjunctival hyperemia and ciliary injection; (the diffuse haze of the cornea; the cataract, the grave lesions of the fundus and the motor paralyses, are the consequences of electrocution). III. The lesions consecutive to the electric discharge may be imputed to a mechanical action of the current on the integrity of the histologic elements and on the cohesion of the tissues of the eye, as well as to the electro-chemical phenomena which are developed by the current.

Ocular Tuberculosis: Remote Results of Excision of Tubercle of the Iris.

TERSON, Paris. (*Annales d'Oculistique*, February, 1904.) Terson, in contra-distinction to Rogman, does not believe in immediate enucleation when intraocular tuberculosis has been demonstrated.

With Lagrange and Parinaud, he prefers temporizing; proposing proper general treatment in cases in which vision still exists. In cases of solitary tubercle he resorts to localized excision.

The author reports an instance of solitary tubercle situated at the periphery of the iris, in which simple excision of the tumor mass was not followed by a return of the affection. After a period of fourteen years, gross objects could be recognized with the aid of the eye. Mention is made of the work of Gourfein who has successfully employed inoculations of the aqueous humor from suspected eyes as a means of diagnosis.

Unilateral Amaurosis and Amblyopia: Tests for Simulation.

NICATI. (*Archives d'Ophthalmologie*, February, 1904.) Nicati describes two tests for the detection of simulation. The first is by the use of a white or colored glass prism placed before the good eye, monocular diplopia being excited by a partial uncovering of the pupil. The lens is then placed fully before the eyes, when the continuance or the disappearance of the diplopia will reveal the presence or the absence of simulation. When the vision of the affected eye is very weak, thus allowing the patient to detect the differences in the distinctness of the two images, a convex lens should be placed before the second eye: this will correct this

complication, and thus allow an estimation of the amount of diplopia to be obtained. The presence of strabismus, the author says, also disturbs the test, though the characteristic relationship of the images allows the detection of the simulation.

The second test is made by the use of a dull finished glass placed before the well eye. If the patient still sees the test candle, for example, simulation is at once evident. In order to determine the degree of vision of the eye which is claimed to be the affected one, the dull glass should be moved forward and backward before the good eye. If a reading of the type continues without any hesitation, the vision of the two eyes must be about equal: Where hesitation is present, the true vision of the affected eye can be determined by the degree of strength of the lens which it is necessary to place before the good eye in order to permit uninterrupted reading.

The General Etiology of Ocular Malformations.

VAN DUYSE, Ghent. (*Archives d'Ophthalmologie*, February, 1904.) Malformations of the eye, Van Duyse says, arise during the first seven weeks of fetal life; the embryonic period, which includes the development of the primary and the secondary ocular vesicles and terminates with the closing of the fetal fissure.

During the fetal period, the abnormal processes, the author tells us, are designated as pathological. Ballantyne believes the two processes usually seem to be identical as to cause, the difference being only in the period in which they develop. Von Hippel has ascribed a very important part to heredity in the production of the most important malformation of ocular colobomata. A rare manifestation of direct heredity in which the mutilation of an eye is transmitted under the form of an anomaly such as artificial anophthalmus being succeeded by a coloboma; and ocular tuberculosis by microphthalmus. Of the the pathologic conditions arising during the fetal period the most prominent are: corneal opacities, the result of uveitis; hydrophthalmus; certain forms of microphthalmus; and apparent anophthalmus, cryptophthalmus, and palpebral colobomata.

Some of the malformations appear to be dependent upon the condition of the brain: as encephalon with ocular colobomata, hydrocephalus and encephalocele with colobomatous

cysts. Ziegler, he reminds us, classifies congenital anomalies as typical or atypical; the former being due to intrinsic causes, and the latter to extrinsic disturbances. By many authorities, the possibility of an inflammatory process during the embryonal period is denied, the disturbance in development resulting from a process of unknown modality.

Among the teratogenetic causes, he says, may be mentioned concussion, traumatism of the uterus, disturbance of nutrition, detachment of the ovum, hemorrhage from modification, and intoxication of the maternal blood by infectious diseases, syphilis, etc. Possibly, he says, one may add toxic states, such as alcoholism and autointoxication. Another cause of arrested development which he has found consists in the relations of the amnion and the embryo (any disturbance of the former, such as incomplete formation, adhesion, resulting in corresponding changes in the latter). These various causes of malformation, may, he tells us, unite in various ways and continue their actions into the fetal period, and thus explain the coexistence of embryonic and fetal changes, such as colobomata and inflammatory lesions, in the same eye. In the prevention of these anomalies, a history of heredity is of importance; particularly so when it is reinforced by consanguinity.

A Case of Metastatic Carcinoma of the Two Chorioids.

COPPEZ, Brussels. (*Archives d'Ophthalmologie*, February, 1904.) Coppez reports the case of a 43-year-old man who complained of seeing poorly with the right eye. Ocular examination was negative, except for a reduction of the vision of that eye to one-sixteenth of normal with the presence of a small central scotoma. On the left side of the neck there was a collection of hard nodular glands. A month later the right eye had become blind, the ophthalmoscope showing a distinct optic neuritis with an apparently dense growth situated in the lower retinal field, while in the macular area there were several small isolated elevations.

The left eye now became affected and developed changes similar with those that were found in the fellow. The tumor in the neck, which proved to be a carcinoma, was excised but soon returned.

After several attacks of hematemesis, the patient fully succumbed. No postmortem examination was allowed.

The case is presumed to have been a cancer of the stomach because of the type and the location of the glandular involvement.

Metastatic carcinoma of the chorioid, the author says, is much more frequent in women than it is in men; and it usually follows cancer of the breast. When it occurs in man, the diagnosis is often rendered difficult because of the apparent absence of the primary lesion. Several writers, he tells us, have noticed the fact that muscular carcinoma is usually bilateral in character: but none of them offer any tangible explanation.

The Adult Neuroglial Tumors of the Optic Nerve and Retina.

SOURDILLE, Nantes. (*Archives d'Ophthalmologie*, February, 1904.) Sourdille reports in detail the microscopic examination of a tumor of the optic nerve of a woman of 22 years of age. The orbital portion of the nerve was invaded, and was replaced by a growth the diameter of a pea and three centimeters in length.

Microscopically, the tumor consisted essentially of very fine fibrils of an indefinite length, showing all the physical characters and reactions of neuroglial fibrils. The fibrils were either grouped into fasciculi or arranged as a reticulum, being united to one another by albuminous cement. Between them or at the points of their intersection, were found nuclei of small size, some of which were isolated and others were surrounded by a protoplasmic body of variable form; but which for the most part, were round or oval. The tumor was furrowed by numerous cavities, which were filled with an albuminoid substance that was similar to that already mentioned, and in which were distributed voluminous polymorphous cells, having one or two short prolongations that occasionally resembled certain types of bipolar nerve cells. The tumor therefore was considered to be of neuroglial origin or glioma, although it was very different in appearance from glioma of the retina.

The author compares the above forms of glioma with fibrosarcoma and round celled sarcoma, glioma being composed of adult tissue and the latter of embryonic tissue. In order to permit a clearer definition of terms, he proposes the name "adults' glioma" for a growth with the characteristics which are described above, and the term "embryonic glioma" for

that type which is found in the retina and which is composed almost entirely of cellular elements. He believes that in most cases, tumors of the optic nerve are of the adult type, while those of the retina are embryonic. He asserts that most of the optic-nerve growths which are described under the names of myxosarcoma, fibromyxoma, fascicular myxoma, etc., are purely adult gliomata of the type described above.

Of Tubercular Iritis and its Treatment.

ABADIE. (*Archives d'Ophthalmologie*, March, 1904.) Abadie reports in detail two cases of tubercular iritis. He mentions other examples in which after failure of specific treatment given because of suspected syphilis, practically complete recovery following the use of guaiacolated cod liver oil, given internally or by friction. He has also usefully employed an organic compound of iodine called idogenal with muscle juice which is prepared by Lefrancq. In the reported cases, the involvement was so extensive as to threaten complete ocular destruction. The author believes that by reason of a tendency to relapse, treatment should be continued for a long period of time. He remarks upon the sanatorium treatment of pulmonary tuberculosis to the exclusion of the use of drugs. He believes that the drugs mentioned above would also offer much aid in the treatment of so-called phthisis. He says that enucleation for ocular tuberculosis should only be done in extreme cases—when ocular disintegration is complete.

Ophthalmologic Notes.

DE BRITTO, Port Alegres, Brazil. (*Archives d'Ophthalmologie*, March, 1904.) De Britto reports the following interesting ophthalmic cases.

The first case seen was one of *epithelioma of the cornea*. The patient, a thirty-seven-year-old man, had noticed a small "pink" growth on the inner side of his right eye some six years previously. This tumor remained quiescent until a few months before he was seen by the author, at which time the cornea was hidden by an almond-sized growth which extended for a short distance onto the sclera. Enucleation was performed. Microscopic study of the tumor showed it to have sprung from the conjunctiva of the internal angle,

and that it had deeply invaded the cornea and the interior of the globe at the level of the filtration angle.

The second case was one of *double orbital meningocele*. The patient, a child of five years of age, was born with a tumor on each side of the nose on a level with the eyes. Examination showed that the growths extended from the inner ends of the upper eyelids to the nasolabial grooves. The masses were separated by a shallow furrow. They were non-compressible and nonpulsatile, although their contents were undoubtedly liquid. Aspiration revealed the presence of normal cerebrospinal fluid which quickly reformed.

The third and fourth cases were examples of *profuse hemorrhage* occurring in the first instance, two days after a cataract extraction, and in the second, during an iridectomy for secondary glaucoma. Both subjects were markedly arteriosclerotic. In the first case, a final vision of one-half of normal was obtained.

The fifth case was one of *essential intraocular hemorrhage* with multiple relapses followed by spontaneous cure. The case was seen in a twenty-eight-year-old man, who, during the five years previous, had had repeated attacks in which the vision of one or the other eye was markedly affected. At the time of the last examination there remained but two large flakes in the vitreous humor of the left eye. In the right eye there was the typical formation of a mass of connective tissue in the vitreous which extended across the optic disc, and to which the mass appeared as if adherent at the point of emergence of the central retinal vessels. In this case there was not any obtainable causative history. The author assumes a congenital dyscrasia with a predisposition to vascular lesions.

The sixth case was one of *multiple relapsing chalazia* with extirpation of the Meibomian segment of the eyelids a method of preventive treatment. In this case, a man of twenty-six years of age, chalazions repeatedly formed in all of the eyelids. During an attack involving the left lower lid, the author split the lid border for a distance of four millimeters, so as to include the Meibomian glands, and part of the tarsus in the posterior layer. This layer, with the overlying conjunctiva, was excised. The results of the operation were perfect. To the objection that entropion might result

from such a procedure, the author replies that there is no danger if but a part of the tarsus is removed.

Comparative Lesions of the Retina and of the Other Organs in Patients Affected with Retinitis Brightii.

OPIN AND ROCHON-DUVIGNEAUD. (*Archives d'Ophthalmologie*, March, 1904.) Opin and Rochon-Duvignaud review the history and theories of Retinitis Brightii, reporting five cases in which pathological studies had been noted. They have drawn in part the following conclusions:

Lesions of the chorioid are more frequent than those of the retina; they affect especially the arteries, though without destroying the veins, and vary from a simple contraction by an endovasculitis to obliteration and atrophy of the vessels. Interstitial hemorrhages are often met with, but they are rarely found in the connective tissue proper of the chorioid.

The nutrition of the pigment epithelium and of the chorioid is often altered. The retinal lesions are generally localized at the posterior pole of the eye, sparing the equatorial and the anterior regions.

In the affected zone, the internal layers are the most disturbed, although even the rods and cones may be involved. The most apparent changes are edema, hemorrhages and fibrinous infiltration. The alterations of the essential retinal structures are seldom destructive. The fatty degenerations are not important. There is not any increase of the normal elements nor are there any invasions by inflammatory cells. The vascular lesions are more frequently found in the chorioid; but those of the retina are more often affected by reason of their method of distribution. The lesions of the vessels however are insufficient to explain all of the visible alterations of the tissues. (The only organs that were found affected in their cases were the eyeballs, the kidneys, and the heart; the lesions of the last being however in no way comparable with those of the other two). The optic nerve is not affected primarily; secondary degeneration following retinal lesions. The retinitis, they say, may not be considered simply an edema Brightii, edema not always being present: and moreover, it is not the decisive form taken by the retinitis. The authors discuss the pathogenesis of the condition, and while sustaining the theory of the dependence of the ocular

lesions upon those of the kidney, are quite unable to explain the nature of the relationship.

A Case of Traumatic Enophthalmus.

LE BOUX, Caen. (*Archives d'Ophthalmologie*, March, 1904.) Le Boux reports the case of a fifteen-year-old boy who was kicked in the face by a horse. The patient's nose was broken, and there was a wound at its base, with another of the left upper eyelid. The eye was not injured. For two weeks' time the eye was prominent and the lids were so swollen and discolored that they could not be opened. A few weeks later, there was marked enophthalmus. The ocular motions, intraocular tension, and the eye-grounds were all normal. The pupil was moderately dilated, and the iris was inactive to light stimuli and accommodation. Vision was reduced to one-eighth of normal, and there was a central scotoma for green.

The author discusses the various theories for the production of traumatic enophthalmus, and to explain his case, adopts that which was proposed by Mak'okau and Lederer; that is, of traumatic retrobulbar hematoma followed by atrophy of the orbital fat.

The Operation for Ptosis.

PARINAUD, Paris. (*Annales d'Oculistique*, March, 1904.) Parinaud describes this operation as follows. The upper eyelid being everted, the attached border of the cartilage is seized at its middle third by a pair of fixation forceps. With a second pair of forceps, or with a hook, the eye is fixed by grasping it above the cornea. These instruments being held by an assistant, the conjunctiva is divided along the border of the cartilage for a distance of twelve or fifteen millimeters by means of a scissors. The conjunctiva is then separated in such a manner as to uncover the ocular globe without injuring the cul-de-sac. The superior rectus muscle being exposed, it is raised by means of a forceps or a hook, and through it and its capsule is passed one of the needles of a double needle suture.

The third step of the operation consists in removing a small portion of the border of the cartilage, after which the forceps are employed to fix the eyelid by grasping it in its entirety. Each needle is passed through the edge of the

conjunctiva near to its point of division, then through the cartilage near the resected border, piercing the skin at about four millimeters distance from the lid margin. The point of emergence of the suture should be situated at six millimeters distance from one another. The suture is then tied over a tampon of cotton or gauze, and a light dressing is applied. On the fourth day the suture is untied in order to judge and to regulate the effect. If the result is insufficient, the suture is retied, and left until the sixth or the eighth day.

The operation is said to be simple, and in the adult subject, it can be done without the use of a general anesthetic. The only difficulty which arises is the searching for the muscle through the conjunctiva and capsule without injuring the cul-de-sac. The author has found the method very efficient. When an apparent over effect is obtained at first, the later results are satisfactory because of a natural tendency toward readjustment of the relationship of the parts. This power of functional adaptation is claimed to be the point of superiority of the method over that which is employed by Motais.

The Mechanism of Accommodation.

TSCHERNING, Paris. (*Annales d'Oculistique*, March, 1904.) Tscherning states that the crystalline lens of the enucleated eye is not the same form as it assumes during accommodation; but of that during repose—or even more flat; and that by traction on the lenticular capsule the lens bulges in the center and flattens at the margins. Therefore, he says, the hypothesis of von Helmholtz, that the lens capsule is relaxed during accommodation is incorrect.

The findings also demonstrate that during accommodation the refraction of the lens is not the same in all parts, it being much the greatest in the center; the peripheral portions being flattened. The experiments of Besio and of Grossman also reveal the facts that during accommodation there is an increase in the curvature of the anterior and the posterior surface of the lens body, although the change in the latter is slight while the diameter of the lens is noticeably diminished. These changes, the author ascribes to the mode of insertion of the zonular fibres into the ciliary body. Those from the anterior surface of the lens have almost the same direction as the muscle, and must be placed under ten-

sion by contraction of the latter. The direction of the fibres from the posterior surfaces, however, is such, he says, that the contraction of the muscle relaxes them.

The change in the curvature of the anterior lens surface has been shown to depend upon tension of the capsule. This tension being absent on the posterior surface, the author ascribes the changes in the shape of this portion of the lens to the peculiar structure of the vitreous body and to the relationship existing between the ciliary body and the vitreous humor. The peripheral parts of the vitreous are drawn forward by a contraction of the ciliary muscle. The lens is thus compressed between the anterior capsule and the body of the vitreous. This fact, together with that of diminished resistance at the posterior pole of the eyeball, by reason of the persistence of the canal of Cloquet, explains the changes which are found in the shape of the posterior surfaces of the lens, as well as the lessening of the diameter of the lens, and the flattening of its margins.

The apparent sinking of the posterior surface of the lens during accommodation, the author ascribes to changes in the lens which are anterior to the posterior capsules, because their relations of the lens and the vitreous are too intimate to allow a complete falling of the former. The trembling of the lens occasionally observed during accommodation and the use of eserine, the author attributes to a relaxation of the posterior capsules and to the hypothesis that the central part of the vitreous humor becomes liquid during accommodation—due to a dilation of the central canal or to a liquefaction of the parts about it.

The Operation for Secondary Cataract.

MANOLESCO, Bucharest (*Annales d'Oculistique*, March, 1904.) Manolesco waits for a period of four months after the extraction of cataract in order to avoid any stirring up of any latent infection—although this condition, he says, may persist for much longer periods of time than this. In operating upon a secondary cataract where the iris is still elastic and the membranes are not too dense, he enters the knife at the temporal side, some three or four millimeters above the corneal summit. The point of the instrument is carried to the upper part of the membrane in the median line. The membrane is then punctured and divided downward

the cutting edge of the knife being brought forward by elevating its handle.

When the secondary cataract consists of a dense central part with delicate margins it may be removed by grasping the central part with an iris forceps and tearing it away from the ciliary attachments.

In other cases, the author performs section of the cataract with a double knife and then extracts a portion of the capsule by grasping it through the corneal wound, withdrawing it, and excising it.

On the Action of Hot Water Applied Directly to the Cornea in Corneal Infiltrations.

MANOLESCO, Bucharest. (*Annales d'Oculistique*, March, 1904.) In such cases Manolesco applies hot water as follows: The eye is cocainized and a speculum is introduced into position. Water of the temperature of 70-80° C. is dropped upon the membrane from a dropper, the procedure being continued for four or five minutes' time and repeated twice daily.

The immediate effect is an increase in the symptoms for a few hours' time: this is followed by an increased absorption of the infiltrates. This treatment, he says, seems to be more efficient than that of any other form of local application and is easily applied.

Clinical Note Upon Free Foreign Bodies in the Anterior Chamber.

DE MICAS, Toulouse. (*Recueil d'Ophthalmologie*, January, 1904.) De Micas has collected six reported cases of free foreign bodies in the anterior chamber including one of his own. The foreign bodies were small, being pieces of stone or glass or ciliæ which, after producing slight degrees of disturbance at the time of entrance, remained quiescent for periods of time varying from a few months to eighteen years, when inflammatory symptoms reappeared with or without any other assignable cause. Although the anterior chamber, he says, is quite tolerant to the retention of foreign bodies, they should be removed at the earliest possible moment. Before attempting extraction, the pupil should be contracted in order to prevent as much possible the falling of the foreign body into the posterior chamber.

The Utility of Charts of the Visual Fields in the Diagnosis of Post-traumatic Neuroses.

MAHILLON. (*Recueil d'Ophtalmologie*, January, 1904.) Mahillon concludes that when perimetric examinations are carefully made under proper conditions, the fields obtained offer important corroborative evidence of the presence or the absence of traumatic hysteria,—and that no expert opinion can be considered complete without a thorough functional examination of the eyes. He believes that attempts at simulation of the color fields can be readily detected, notwithstanding many opinions to the contrary.

The General Prognosis of Certain Systemic Diseases as Expressed by the Ocular Signs and Symptoms.

DE MICAS, Toulouse. (*Recueil d'Ophtalmologie*, February, 1904.) De Micas reviews the prognostic significance of the ocular lesions in general diseases. He says that the appearance of corneal ulcer, keratomalacia, or amaurosis in the declining stages of the general diseases, are always of grave prognostic significance. In a case of malignant measles, acute hemeralopia and conjunctival xerosis were early complications. Corneal ulceration in small-pox, he states, has no general significance, but keratomalacia and exophthalmus are of grave importance. Sudden blindness in whooping cough is a grave symptom as are the ocular accidents which accompany typhoid fever. In cholera, mydriasis, miosis, absence of iris reaction to light, and conjunctival ecchymoses, are all of fatal import. The ocular complications of syphilis indicate severe general infection. In diabetes, retinitis and cataract are unfavorable conditions.

The importance of retinitis in the diagnosis and prognosis of Bright's disease, he says, is well known.

In the old, rapid corneal destruction without apparent causes, indicates an early approach of death.

Malarial Intoxication, Retinal Detachment, and National Responsibility.

TRUC. (*Revue generale d'Ophtalmologie*, Feb., 1904.) Truc reports a case of retinal detachment complicating a prolonged malarial intoxication in a soldier of the tropics. The patient had also suffered from taenia and dysentery, but these affections were of brief duration.

Because of the absence of other etiologic factors, the author believes that the malarial intoxication was the direct cause of the condition. The literature of the subject, he says, is scanty. Terson, the elder, has reported two instances in which the relation between the two conditions seemed distinct. The responsibility of the government for the malarial intoxication is evident; and the author believes it to be likewise so for the ocular changes.

Clinical Characteristics of Syphilitic Chancre of the Bulbar Conjunctiva.

ROLLET. (*Revue generale d'Ophthalmologie*, March, 1904.) Rollet reports a case of chancre of the bulbar conjunctiva. The patient was a woman, thirty years of age, who had been married four months and who was pregnant. Her previous history was negative. The husband stated that he had had an initial sore some two years previously, and that he had been taking specific treatment ever since. He was, however, still suffering from buccal mucous patches. The patient first noticed a redness and an itching at the inner angle of the left eye. At the first examination there was a wheat-grain-sized tumor which was capped by a yellow superficial ulcer situated on the inner lower part of the left eyeball. Later the growth became the size of a hazel nut. It was covered by a yellow superficial ulcer which was surrounded by an injected margin, and which was accompanied by marked chemosis. To the touch the tumor was "wooden" and dense. The preauricular glands, which were large, were painless. There was a less marked degree of swelling of the submaxillary glands. The chancre healed after a duration of three months, leaving but a few bulbopalpebral adhesions. During this time, cutaneous and other external symptoms of syphilis, appeared.

The author states that but sixteen cases of chancre of the bulbar conjunctiva are reported, although those of chancre of the eyelid are numerous. In the diagnosis of the condition, the induration of the growth, the wooden character of the chemosis, the hard, indolent, slowly evolved adenopathy, and the spontaneous resolution are all most important distinguishing points. The character of the ulceration and the condition of the exudate are the results of the location and constant moisture.

"Gray Oil" in Subpalpebral Massage in Place of Subconjunctival Injections, and in Ocular Therapeutics.

VACHER, Orleans. (*La Clinique d'Ophthalmologie*, 10th February, 1904.) Vacher employs an ointment made of twenty-seven parts of purified mercury; six parts of "double" mercurial ointment; forty-five parts of anhydrous lanoline; and twenty-two parts of vaseline or sweet almond oil. This mass, he says, is compact, homogeneous, and nonirritating. It is introduced into the subconjunctival cul-de-sac by means of a large tipped small syringe.

Upon contact with the conjunctiva, the oil readily softens. Massage through the closed lids is then applied. A small additional amount of the oil is then introduced and the eyelids are kept closed under a light dressing for a period of two hours. In the treatment of corneal ulcer, the ulcerous area is first curetted and is then filled with the gray oil which is rubbed into the parts with a smooth glass rod. For the various affections of the iris, the ciliary body, and the deeper parts of the eyeball, massage is to be applied from the center of the cornea to its periphery. This mercurial massage, the author says, acts in two ways: first, mechanically, and second, by favoring the absorption of the mercury, as larger amounts are thus taken up by the subconjunctival injections.

The author has applied this form of treatment with good results in cases of ulcerating blepharitis, acute conjunctivitis, ophthalmia neonatorum, keratoconjunctivitis, corneal ulcer with hypopyon, iritis, iridochorioiditis, and in abscess of the lacrimal sac.

More recently, he has found it advisable in some cases to introduce a small amount of the material into the inferior cul-de-sac after cataract extraction.

Reattachment of the Retina Consecutive to the Formation of a Secondary Cataract and its Spontaneous Absorption.

NICATI. (*La Clinique Ophthalmologie*, 10th February, 1904.) Nicati reports a case of the above nature which was under his observation for a period of twelve years. This case led him to do a disquisition upon two other cases of retinal detachment; but the results were negative.

Treatment of Scars of the Cornea by the Use of Subconjunctival Injections of Benzoate of Lithium.

OLIVERES. (*La Clinique Ophtalmologique*, 10th February, 1904.) Oliveres employed a cubic centimeter of one per cent. strength solution of lithium benzoate in the form of subconjunctival injections in the treatment of corneal scars. The method, he states, does not produce any reaction and is more efficient than the substance is when it is used in the form of a collyrium. He has found that six injections usually produce a maximum effect.

A Large Foreign Body in the Inferior Cul-de-Sac.

DE MICAS, Toulouse. (*La Clinique Ophtalmologique*, 10th February, 1904.) De Micas reports the case of a young blacksmith, who, while forging, was struck in the eye by a piece of sponge iron, which he asserted felled him to the ground. The patient had considerable pain at first—which disappeared by the use of cold compresses. The swelling, however, continued.

When seen by the author some days after the accident, the only visible injury to the lids was a singeing of the lower cilia. From the middle of the palpebral fissure there protruded a tip of a piece of iron. Under chloroform anesthesia this mass was extracted and was found to be two by one centimeters in size. There was a third degree burn of the cornea and the inferior cul-de sac. Total symblepharon being apparently unavoidable, the eyeball was enucleated.

Electrical Ophthalmia.

VALOIS, Moulins. (*La Clinique Ophtalmologique*, 10th March, 1904.) Valois reports two cases of ocular disturbance which was due to electricity. The first case was that of an electrician who worked for a half hour regulating arc lamps without using protecting glasses. The same night the patient was awakened by orbital pain. Examination revealed an acute conjunctivitis which subsided in two days' time. The second case passed an hour or two daily regulating arc lamps. For some time he had noticed failing vision with attacks during which he became almost blind. Examination showed a vision of six-tenths of normal in apparently emmetropic eyes. The temporal halves of the optic discs were pale, and there was concentric contraction of the visual fields.

The author states that electricians often complain of scotomata, failing vision, and limited fields of vision.

Simple Procedure to Replace Extirpation of the Lacrimal Sac.

SCHULTZ. (*La Clinique Ophthalmologique*, 10th March, 1904.) Schultz has successfully employed obliteration of the canaliculi by the galvanocautery in the treatment of obstinate cases of lacrimal sac and duct disturbances. He introduces the point of an electrode to a depth of four millimeters into the the canaliculus and allows it to become and remain incandescent for a period of two seconds.

He has not found any evil results to follow except an epiphora, which he has also seen after extirpation of the sac.

On the Action of the Antitoxic Serums in the Treatment of Infected Corneal Ulcers.

DARIER, Paris. (*La Clinique Ophthalmologique*, 25th March, 1904.) Darier reports a case of infected corneal ulcer, cultures from which showed the existence of the pneumococcus.

Other treatment failing, the author gave two injections of ten cubic centigrammes of antidiphtheritic serum on two succeeding days; a rapid cure following.

He remarks on the work of Roemer who has employed antipneumococcic serum in sixty cases of corneal ulceration with great benefit. Microscopic study, he says, usually reveals the presence of the pneumococcus in the cases, but where this germ is absent, the serum, being harmless, it is given nevertheless as a prophylactic. Roemer, he informs us, uses ten cubic centigramme doses, repeating them some three or four times on an average. The method is at times combined with subconjunctival injections of salt solution in order to aid penetration of the bacteriolysines.

Stereoscopy and Visual Projection.

PARINAUD, Paris. (*Annales d'Oculistique*, April, 1904.) Parinaud discusses and demonstrates the following proposition: I, Stereoscopic vision is not obtained by the fusion of the figures which are used for this purpose, but it is gotten by fusion of the true images of the figures. II, Stereoscopic relief has its cause in the different localization of the images of binocular projection, according as they are "exteriorated"

by corresponding or non-corresponding parts of the retina; and III. This different localization is the consequence of the localization of the binocular images at the intersection of the principal and secondary axes of projection.

Stereoscopic vision, the author says, although habitually produced with suitable instruments, is, in reality, in no way dependent upon them; nor is binocular vision to be considered normal, because certain adaptations of the visual apparatus must be induced in order to produce the stereoscopic effect of a third dimension. By means of some accompanying figures, he demonstrates that stereoscopy is obtained by a relative divergence of the ocular axes with the production of a crossed diplopia, and that pseudoscopy is gotten by an exaggerated convergence with the production of homonymous diplopia. The horopter, he says, is a sort of objective representation of the identity of the retinae. The theory, he thinks, however, denied the existence of two fundamental properties of the binocular visual apparatus; the faculty of the fusion of images exteriorated by non-corresponding parts of the retina, and the localization of the binocular images at the intersection of the axes of projection, for the non-corresponding points as well as for those from corresponding parts.

These two properties of the binocular visual apparatus, he believes, are the essential cause of binocular vision.

The diagrams and easily repeated experiments of the author seem to demonstrate the truth of the above propositions. He suggests that because Girard-Teulon declared the law of intersection of the axes of protection was general and applied it to all secondary axes, the law be named "The law of Girard-Teulon."

Of the Forms of Glaucoma with Intermittent Crises and their Treatment.

ABADIE, Paris. (*Annales d'Oculistique*, April, 1904.) Abadie briefly reports several cases in order to demonstrate that in those cases of glaucoma with intermittent crises of pain, colored rings and obscuration of vision, the miotic treatment is successful only for a time, and with such treatment only the vision is sooner or later lost after the appearance of the more acute forms of the disease. In many cases of this type the author has employed an early iridectomy with perfect results, and joins with Fuchs in his advocacy of

such a form of operative treatment of these intermittent types of the affection.

**Variations of the Volume of the Normal or Glaucomatous Eye
Under the Influence of Modifications of the Molecular Concentration of the Blood.**

CANTONNET. (*Archives d'Ophthalmologie*, April, 1904.) The reported experiments of Cantonnet were all performed on young rabbits. One eye was rendered glaucomatous by a laceration of the filtration angle and the other was left intact. The ocular measurements were made under cocaine. The changes in ocular tension were estimated by studies of the corneal diameters.

By reason of the distensibility of the ocular coats of the young rabbit they were preferred to the old ones. The experiments included corneal measurements after ligation of one or both kidney pedicles, with allowance or discontinuance of liquid food; and subcutaneous or intravenous injections of isotonic or hypertonic solutions of chloride of sodium, sulphate of sodium or glucose.

Ligature of the kidney diminished the volume of the eye; the injections produced less oscillation after than before ligation; the normal eye reacted less than the abnormal one; and the hypertonic injections produced more reaction than the isotonic, and the intravenous than the subcutaneous. The introduction of blood into the crystalline lens, would, he says, modify its concentration and determine a flow of liquid toward it from the tissue. It is therefore natural, he thinks, that there should be diminution in the volume of the eye in the first hour after injection, and that this should appear more rapidly after intravenous injections, and also after the use of hypertonic solutions.

He found that the cycle of oscillation varied with the conditions due subsequent to the methods that had been employed; while the greater variations of the glaucomatous eye were self explanatory. He determined that ligature of the kidneys acts similarly with a concentrated intravenous injection; this he believes, explains why the oscillation that follows injections after the ligature are less than those when the injections have been made before. The *ensemble* of these variations, he asserts, may be readily attributed to the osmotic modifications of the equilibrium of the blood and the hu-

mors. Mayor, he says, has recently ascribed these phenomena, in the greater part, to the reflex results of vascular sensibility. The author however, believes this theory to be of minor importance.

On the Theory of Skiascopy and on My Electric Skiascophthalmometer.

WOLFF, Berlin. (*Archives d'Ophthalmologie*, April, 1904). In his instrument the author employs a carbon wire of an electric light as a source of illumination. This, he finds, casts a triangular sector of a cone instead of a true cone of light, and thus permits a much more definite play of light and shadow owing to the absence of ellipses of diffusion. Especially is this so in astigmatism.

On the Treatment of Total Trichiasis.

CANGE AND BENTAMI, Algiers. (*Archives d'Ophthalmologie*, April, 1904.) Cange and Bentami employ the method of Dianoux which they apply as follows:

Four millimeters above the margin of the eyelid and parallel to it, a cutaneous incision extending the entire width of the lid is made. The lower lip of the incision is dissected from above downward, and the flap is so formed that it grazes the anterior face of the tarsus and contains the ciliary bulbs. The lid margin is divided along this line. A second incision is made parallel to and four millimeters above the first, and this bridge of tissue, except at the extremities, is dissected free. The ciliary flap is now drawn above the cutaneous flap and is fastened to the upper lip of the palpebral wound by means of three or four fine silk sutures. The upper flap is drawn down under the ciliary flap and is sutured to the inferior part of the tarso-conjunctival margin.

The authors report five cases of total trichiasis in which good results were obtained by the above method.

Relapses, they say, did not occur; any after trouble being due to an imperfect inclusion of the cilia in the ciliary flap. The eyelashes that were left in the tarsus border were readily destroyed by means of the cautery. To aid in the dissection of the ciliary flap the authors outline the same by a shallow intermarginal cut. The operation, they inform us, has been objected to because of the danger of sloughing of the cutaneous flap. This they have found will not arise if the flaps are properly made.

Experimental Researches into the Ocular Phototraumatism Produced by the Electric Light.

METTEY. (*Archives d'Ophthalmologie*, April, 1904.) All the experiments of Mettey were performed on adult rabbits and dogs. In each instance the right eye was exposed, the left being used as a control organ. The animals were restrained in proper apparatus and the eye was kept open by means of a speculum. The light employed was that of the arc of a current of ninety volts and twenty-two amperes, placed at a distance of fifty centimeters with a time exposure of fifteen minutes. The microscopic results of the tests were negative. Study of the retina by Nissl's or Bethe's method revealed no changes in the ganglion cells or other parts of the same. The pigment epithelium also failed to exhibit any alterations. The optic nerves were studied after having been removed with the greatest care. By the Marchi method minute points of degeneration of the myelin were found scattered along the connective tissue framework of the nerve for a distance of six millimeters back of the globe. In those cases in which the optic nerve was studied, the exposures were repeated ten times—with a total duration of ninety minutes.

In a few instances the author employed red glass globes in order to exclude the chemical rays. In these cases no changes could be found; but as some luminous rays were likewise suppressed, the cause of the changes found in other cases, he says, may have been dependent upon either arc or rays.

The author believes that the disturbances seen were the results of the luminous rays.

On Pressure Massage in the Treatment of Myopia, Alone or Associated with Other Modes of Treatment.

DOMEC, Dijon. (*La Clinique Ophthalmologique*, 10th and 23th April, 1904.) Domec has applied pressure-massage in the treatment of one hundred cases of myopia of various types; simple, progressive, and progressive with chorioidal lesions. In applying the treatment, he sits in front of and just to the right of the patient. The back of the thumbs is placed upon the centers of the closed eyelids over the corneal summits with the fingers situated on the side of the head. Gentle pressure backward, and usually a little up-

ward, is made. This pressure is exerted, not by thumb action, but by a free arm motion and is repeated from one hundred to two hundred times. The pressure must be graduated to the case and must be very carefully used for the first time in order to avoid pain. The massage is given for ten or twelve successive days, and then an intermission of two or three weeks is allowed. The benefits of the treatment, the author believes, are due to its effects upon the posterior vessels and nerves before their entrance into the globe; and, indirectly upon the retina through the optic nerve. In the case reported the beneficial results of the method included marked improvement of vision, maintenance *in statu quo* of the degree of myopia, and a limitation of the changes in the posterior portion of the eyeballs.

Abnormal Retinitis Pigmentosa in Twin Brothers.

DUJARDIN, Lille. (*La Clinique Ophtalmologique*, 10th April, 1904.) Dujardin reports cases of twin brothers of twenty years of age. Their father and mother were full cousins. There was not any other hereditary taint. The visual condition had existed from birth. There was nyctalopia. The vision, with a corrected hypermetropia of three and one-half diopters, was one-fourth of normal. The fundus changes were not marked, being scattered throughout the retinae, though they were more especially pronounced in the central zones, in which situations there were small irregular indistinct points of dark pigment among which a few small areas of chorioidal atrophy could be seen. The optic discs were slightly discolored and the retinal vessels were somewhat contracted.

On the Extraction of the Transparent Crystalline Lens in High Myopia.

SNELL, Sheffield. (*La Clinique Ophtalmologique*, 10th April, 1904.) Snell operates only on those cases in which there is a myopia of fourteen diopters or more. After atropine dilation the lens is needled, and usually a week later the softened lens masses are removed through a peripheral corneal incision. If the ocular tension is closely watched and the crystalline debris is promptly evacuated, there is no danger. It occasionally happens, however, that intraocular tension rises even after the cortical masses are removed and

the pupil is free. In such cases eserine should be instilled, and if this proves ineffective, a paracentesis of the cornea should be performed.

Of the fifty-nine cases operated upon but two developed retinal detachment.

Blue Discoloration of the Conjunctiva and Cornea.

KALFFMANN, Cannstatt. (*La Ulinique Ophtalmologique*, 25th April, 1904.) While heating a flask of hectographic ink the mass exploded, completely bathing the face of the patient. The mucous membrane of the nose and mouth was partly stained purple, while the conjunctiva of the globes and eyelids and the corneae were deeply and completely tinted.

The color of the stain was readily removed from the skin by the aid of alcohol and ether, as well as from the membranes of the nose and mouth by weak solutions of the same; washing the eyes with water produced no effect upon the staining, while the use of alcohol being inapplicable, the author applied a two per cent. strength ointment of boric acid. Within three days' time, the eyes were free from stain, though continuing to show marked reaction. Recovery took place in two weeks' time.

REPORT OF THE SECTION ON OPHTHALMOLOGY
AMERICAN MEDICAL ASSOCIATION, FIFTY-
FIFTH ANNUAL MEETING, HELD AT AT-
LANTIC CITY, N. J., JUNE 7th to 10, 1904 *

FIRST SESSION.

**Chairman's Address: Thoughts Suggested by a Study of the
Eye Injuries of Independence Day.**

ROBERT L. RANDOLPH, Baltimore, cited the mortality following this variety of traumatism as compared with other affections. As a means of preventing these injuries he suggested the passing of a law imposing a higher fine for the sale of explosives of this character. He incidentally referred to his efforts to bring this about in the city of Baltimore.

Treatment of Purulent Ophthalmia.

MYLES STANDISH, Boston, briefly reviewed the several characteristics of this disease, and laid great stress on the importance of bacteriologic examination as an aid to diagnosis. He mentioned the various microorganisms at times responsible for the affection, and then passed on to the consideration of the treatment as carried out by him at the Massachusetts Eye and Ear Infirmary. This consisted in gently but thoroughly cleansing the lids and conjunctivas with boric acid solution and the local application of the less irritating silver salts, especially protargol and argyrol. These he believes to be greatly superior to mercuric chlorid, silver nitrate, and other antiseptics, and quotes statistics of his own to prove these assertions. He believes that protargol is more valuable when there is corneal involvement. He sees no indication for the employment of cold in any stage of the disease, and believes it to be harmful, particularly in the stage of swelling.

Discussion.—CASEY A. WOOD, Chicago, said the irritating effects of the silver nitrate were its great drawback and that the tendency at the present period was to employ non-

*From American Medicine.

irritating applications in this disease with a view to prevent undue irritation of the cornea. He referred to the crying its application produced in children and said he considered the congestion following crying more than counterbalanced any good effect the drug might produce. He believes the judicious employment of cold of great value. Cleansing of the lids and conjunctivas by ordinary simple means is far superior to the perforated retractors and similar apparatus as the latter are capable of injuring the cornea. He prefers argyrol to protargol and thinks that it is somewhat anesthetic. He also employs hydrastin in collyrium alternating with argyrol. Maitland Ramsay, Glasgow, Scotland, stated that in his experience purulent ophthalmia was a much rarer disease in Scotland than in this country. He considered cold to be of great help in relieving pain but acknowledged that it may also aid in the corneal destruction. A. W. Calhoun, Atlanta, Ga., spoke of argyrosis following long-continued use of protargol and stated that this danger was less with argyrol. In acute ulceration of the cornea from various causes he believes either in weak solution is curative. F. C. Todd, Minneapolis, stated that he used protargol and argyrol and preferred them to silver nitrate. He thought that the nursing should be considered in comparing cases of this character. In his experience, in which the same nursing was employed but different forms of local treatment, the argyrol and protargol forms of treatment were most effective. He used protargol in one eye and argyrol in the other in one case and the eye in which protargol was employed progressed more rapidly toward recovery. He employs 50 per cent. solutions in glycerin. J. E. Weeks, New York City, said that he washed the conjunctiva more thoroughly than Standish, but did not resort to perforated retractors and similar devices. He believed the new silver preparations to be very efficient and uses them in 35 per cent. solutions every two hours. Cold he believes to be useful in reducing temperature and inhibiting growth of microorganisms and when employed carefully is not harmful to the cornea, and usually makes the patient more comfortable. H. Woods, Baltimore, urged ordinary cleanliness, avoiding instrumental means. Considering the comfort of the patient, he believes cold to be of value. He spoke favorably of argyrol and noted 10 cases in children in which recovery

occurred on an average of eight and a half days after beginning treatment. He uses it twice daily, and has noted no staining or irritation following its use. Seabrook, New York City, uses cold for the swelling after the cornea is involved, and questioned how cold could affect the corneal structure when it was unable to affect the bacteria in the lids, as shown by Standish. J. L. Thompson, Indianapolis, urged the use of the nonirritating forms of treatment, and referred briefly to an early case reported by Loring, in which the eye was lost from purulent ophthalmia. Ritchie, Washington, said he prefers silver nitrate to other silver preparations, and believes it brings about constructive metamorphosis. Park, Harrisburg, stated that he employed thorough washing of the eye every 30 minutes, and dusted nosophen after each irrigation. He prefers it to silver preparations, the best of which he thought to be silver nitrate. N. M. Black, Milwaukee, said he used protargol and argyrol in codliver oil, and instilled them after irrigation. M. Stephenson, Akron, Ohio, called attention to the use of alphasol in ophthalmia neonatorum, 1 to 5,000, and 1 to 2,000. He never uses instruments to wash the eye, but instead employs cotton. L. Connor, Detroit, stated that he experimented with protargol and argyrol, and found argyrol the more effective. He also uses heat. He insists on thorough cleansing every five minutes. E. E. Holt, Portland, Me., believes cleanliness to be of greatest importance. He employs a Davidson syringe, and begins the irrigation at the external canthus. In closing the discussion, Standish stated he had never observed argyrosis following these preparations. As regards the use of cold, he believed the chemosis it induced injured the cornea. In response to the statement regarding the number of patients that get well without treatment, he said, this was not borne out by the numerous patients he had seen in previous years with perforation and scarred corneas.

Postoperative Infection of the Eye.

J. A. White, Richmond, Va., discussed the causes of postoperative infection before and since the antiseptic period, and briefly mentioned the gradual decrease in frequency of this complication during recent years and the apparent reasons for this favorable reduction. From a study of the replies to a circular letter sent to various ophthalmic surge-

ons with a view of determining the percentage of infection after operation, he places the average percentage from 1 per cent. to 2 per cent. He believes that the cause of infection is local and not systemic and reviews the various methods of ante and postoperative treatment. When infection has occurred he thinks the most rational treatment is to reopen the wound, fill the anterior chamber with 50 per cent. argyrol solution, and to cauterize the edges of the wound, employing the open method with irrigation of the cul-de-sac. In preparing his patients for operation and also after operation he uses locally, mercuric chlorid in vaselin. He believes that by this procedure he obtains constant sterilization of the conjunctivas without irritation. He alternates it at times with aqueous solutions before operation, but prefers the unctuous medium. He then quoted statistics to support the use of mercuric chlorid in salve form.

Discussion.—S. D. Risley, Philadelphia, stated that the effect of the drug was of longer duration in unctuous medium, and thought that injury done to the eye by antiseptics was responsible for postoperative infection in large part, and therefore he avoids the use of mercuric chlorid preceding the operation. He uses either boric acid or normal salt solution in preference, taking great care to scrub carefully the edges of the lids with the solution. In a suspicious case of lacrimal or conjunctival disease he uses the alkaline solution, and dilates and irrigates the lacrimal canal and nasal duct. When infection occurs, he uses boric acid solution, normal salt solution, or even mercuric chlorid. He scrubs the lids and conjunctivas with cotton and the solution and applies a weak silver solution to the wound. He has not used modern silver salts, but employs silver nitrate, following it with normal salt solution. Frequently the infection results from unsuspected sources, such as the infecting particles in the expired air of the surgeon or bystanders and dust in the atmosphere of the room, set in motion by various causes. H. Knapp New York City, related cases of apparent infection following operation occurring in syphilitic, gonorrheal and traumatic cases in which the conjunctiva is swollen and a fibrinoid exudation is in the anterior chamber and vitreous, but there is no swelling of the lid. When there is actual infection from lacrimal disease he advises extirpation of the sac after the operation, If the disease is

present and operation is contemplated the canaliculi should be ligated. He briefly referred to a case of this character. Ard, Plainfield, N. J., briefly referred to the condition of spongy iritis with spongy exudate in the vitreous following cataract extraction already discussed by Knapp. J. A. Lippincott, Pittsburg, cited cases of infection occurring in his early practice. He routinely used to cleanse the nose thoroughly before operation to prevent infection but has recently become an advocate of White's method with which he has had great success. He believed it to be the best method of disinfecting the conjunctiva and that the salve became dissolved in part and found its way into the lacrimal canals and nasal duct. E. E. Holt, Portland, Me., spoke favorably of White's method and uses it routinely with success. C. R. Holmes, Cincinnati, stated that he refuses to operate for cataract in the presence of lacrimal disease unless he has extirpated the tear sac; he rejects attempts at cleansing of the conjunctiva in the absence of active inflammation. For irrigating purposes when necessary he employs boric acid solution and sterile water. V. T. Churchman, Charleston, S. C., spoke very favorably of White's method and said he had used it with success. L. Borsch, Philadelphia, laid great stress on cleansing of the eyelashes as well as the conjunctivas. He rejects strong antiseptic solutions and referred to de Wecker's treatment in using mercuric cyanid. F. Parke Lewis, Buffalo, remarked that he uses a weak protargol solution 3 per cent., prior to the operation. He also made a plea for uniformity in the pronunciation of the word argyrol. In closing the discussion White said the treatment after infection was extremely various. Some used 50 per cent. protargol under such circumstances every time the bandage was removed. He expressed great regret that the subject of how to treat the infection after it has occurred had not been more fully discussed. He believed that in all cases the eye'ashes as well as the lids should be carefully scrubbed and the salve applied to them likewise.

CASEY A. WOOD, Chicago, announced that he would, on instruction from the section, present a resolution to the house of delegates in reference to the placing of methyl alcohol among the poisons. He was accordingly instructed.

Tumors of the Orbit.

H. V. WÜRDEMAN, Milwaukee, read a paper on this subject, giving a new classification of these growths in accordance with the demands of modern pathology. He considered them as neoplasms; 1, inflammatory swellings; 2, primary and secondary; and 3, as anomalies. Among the neoplasms he directed attention briefly to those beginning in the eyeball; 1, and primary orbital neoplasm; 2, including those primary to the mesodermal tissues, those primary to the bony walls of the orbit and pia, those primary to the optic nerve and sheaths, those primary to the lacrimal gland, those extending from the skin, conjunctiva, and sinuses; those of metastatic origin, teratoid tumors, cysts, angiomas, and pulsating exophthalmos. Among orbital inflammations he mentioned the primary and secondary varieties and orbital protrusions from inflammation in neighboring sinuses. The various orbital anomalies were described. The paper was well illustrated by 200 or more photographs, drawings and wet specimens. A feature of this paper was the use of the Hoy opaque projector with which the photographs, specimens, etc., were placed behind a very intense illumination and projected through a powerful lens on a screen much in the same manner in which an image is focussed on the ground-glass plate of a camera. Color details were retained. A watch in motion was projected by this apparatus.

Discussion was opened by C. S. BULL, New York City, who stated that he concluded that if the orbital tumors develop in the orbital tissue proper, sheath of the nerve, or periosteum and are encapsulated the prognosis is good, but if not encapsulated, independent of the origin of the growth, the prognosis is bad and each succeeding operation serves only to hasten the return of the growth and to shorten the life of patient. He always gives a frank prognosis and lets the patient decide about the operation. He has observed improvement from use of the Röntgen ray in three cases and feels justified in using it in all cases as it undoubtedly relieves pain in every case. E. C. Ellett, Memphis, Tenn., cited cases of orbital growths. L. W. Fox, Philadelphia, referred to a case of orbital sarcoma in which the Röntgen ray had effected a cure after operation had been rejected. He stated that he believed in the so-called inop-

erable cases it was useless to perform any operation, as it served to make them worse and to exaggerate any tendency to metastasis. He thought the Röntgen ray prevented development of tissue and should be employed in all cases. Klinedienst, York, Pa., gave the history of a case of sarcoma of the orbit with the usual symptoms. J. O. McReynolds, Dallas, Tex., asked if any success had been obtained in glioma with the Röntgen ray. Personally he had not. In closing the discussion, Würdemann stated that benign neoplasms may be removed without the loss of the eye but usually with some loss of function; that all tumors when small should be operated on and later Röntgen rayed; that benign tumors should be extirpated; that the Röntgen ray was often of benefit without operation as in Fox's case, and that the Röntgen ray seems to retard the growth of glioma.

A Case of Pulsating Exophthalmos : Successive Ligation of Both Common Carotids; Death.

HOWARD A. HANSELL (Philadelphia) read this paper giving the history of a case with left-sided pulsating exophthalmos three weeks after injury to the opposite side of the face, venous congestion of lids and ball, partial immobility of the globe, diplopia and deep-seated pain. In spite of prolonged rest in bed and medicinal treatment, the symptoms slowly increased in severity. Ligation of the left common carotid was followed by amelioration of all symptoms and recession of the globe. Relapse in four weeks, attended with retinal hemorrhages. Ligation of the right common carotid, with edema of face and brain, convulsions, and death five days later.

Intermittent Exophthalmos, with the Report of a Case.

WM. CAMPBELL POSEY (Philadelphia) gave a detailed account of this case and illustrated the paper by means of photographs projected by the Hoy apparatus. Both eyes were usually normal, but under violent muscular strain the left eye slowly protruded and by this and other signs showed venous engorgement of the orbit. Symptoms rapidly disappeared on cessation of cause. There was an absence of bruit or pulsation in orbit, or of any visible or palpable tumor. No ophthalmoscopic changes. History

of intermittent exophthalmos. Its great rarity; 46 cases in all literature. Symptomatology: Limitation to one eye. Ophthalmoscopic appearance negative in most cases. Diagnosis easily made from other angiomas of orbit by absence of bruit and pulsation and by the transient character of the exophthalmos. Etiology obscure. No autopsies, and hence no pathologic anatomy. Most authorities believe cause is dilation of orbital veins from individual predisposition to weakness in walls of vessels and by relaxation of orbital fascia. Disease often is congenital, but has followed blows. Prognosis rather favorable. In a few cases vision affected by retinal hemorrhage or by atrophy of optic nerve consecutive to hemorrhage into the orbit, but vision usually remains good. Fellow eye does not become affected. Degree of proptosis does not increase greatly with time. Treatment is unsatisfactory. Electrolysis may be essayed or excision of varix with the knife if the tumor be accessible. Complete bibliography was appended to the articles.

Discussion was opened by C. R. HOLMES (Cincinnati) with the report of a somewhat similar case which he also believed to be due to some pathologic condition of the orbital veins. The one-sided character he believes argues in favor of a local cause. He stated that sometimes it bore a relation to menstruation. L. J. Borsch, Philadelphia, expressed surprise at the great rarity of this affection and stated he had observed several of these cases and employed tincture of gelsemium for six or eight months in them with success. Leaman, Milwaukee, referred to four cases in which ligation of the carotids had been performed with varying results. W. H. Wilder, Chicago, stated that he had observed several cases having similar symptoms which proved to be syphilitic in origin. G. C. Savage, Nashville, Tenn., seemed to think that these cases were all due to angioneurotic edema and mentioned several such cases of his own. W. L. Pyle, Philadelphia, related the history of a case of intermittent exophthalmos secondary to angioneurotic edema in which death ultimately resulted from edema of the glottis. R. A. Randolph, Baltimore, made reference to a case of exophthalmos in which death followed within 24 hours after operation and believed that operation was contraindicated in persons over 60 years of age. In closing the discussion Posey emphatically stated that his cases were not due to angioneurotic edema.

Diaphoresis and Diaphoretics in Ophthalmic Therapeutics.

HIRAM WOODS (Baltimore) and T. A. Woodruff (Chicago) read separate papers on this subject. Briefly stated, these papers consisted of the following deductions from the physiology of diaphoresis and actions of diaphoretics, regarding the class of ocular lesions to which such treatment should be applicable: 1. Congestive. 2. Exudative lesions of such structures as are intimately connected with blood-vessels. 3. To promote elimination of toxic products. Ocular disorders in which they are thus indicated are: 1. Uveitis, especially certain forms of chorioiditis. 2. Iridic congestion of iritis. Effect, so far as observed by the writers, is not marked after formation of synechiae. Retinal detachment dependent on chorioidal exudate rather than that accompanied by degenerative or cicatricial changes, as in myopia. 4. Certain forms of exudative retinitis. 5. Possible hemorrhagic orbital lesions. Narration of an observation in which it seemed to have a marked effect. 6. Toxic amblyopia. Difficulty in estimating value of such agents, when improvement follows withdrawal of toxic agent. Treatment by this method often is disappointing when one would expect, *a priori*, good results. Method of application. Dosage of diaphoretic agents. Good results seen with small doses.

Discussion was opened by W. B. MARPLE (New York City) stating that he believed in the use of diaphoretics, but that the patient's disinclination to inconvenience often influenced the physician in prescribing them. He advises with Kipp, Newark, the use of the Turkish bath, the indications being the same. It is especially valuable in acute uveitis. He also employs the salicylates and aspirin. These he states are less efficient than pilocarpin and the bath, but are certainly of value. In toxic amblyopia he believes withdrawal of the poison is essential, after which diaphoresis may be of benefit. W. L. Pyle, Philadelphia, protested against the routine hypodermic injection of pilocarpin for sweating purposes and related a fatal case following such a procedure. He prefers hot water heat, Turkish bath, hot alcoholic drinks, and Dover's powder to produce diaphoresis in iritis and similar inflammations. He thought salicylates were less efficient and that large doses were unsafe. He employs warm atropin solutions in these cases. Timberman, Colum-

bus, O., agreed with the essayist, and quoted a confirmatory case. W. Reber, Philadelphia, said he relied greatly on pilocarpin when there were no evidences of organic disease. He thought there was no danger if the drug was used carefully. He employs it in iritis. S. C. Ayres, Cincinnati, believed the Turkish baths given in portable cabinets to be preferable to the use of pilocarpin. L. Connor, Detroit, spoke favorably of hydrotherapy, particularly the use of hot water and vapor baths as a means of producing diaphoresis. E. E. Holt, Portland, Me., rose to voice the sentiments of the essayists in regard to the use of diaphoresis and the means of inducing it. J. L. Borsch, Philadelphia, stated that he had employed pilocarpin, and in one instance observed alarming symptoms follow its use. F. Buller, Montreal, Canada, believed pilocarpin to be of value, but also defended the use of the salicylates in all inflammatory and other conditions of the uveal tract, and cited several cases in which they were of value. Thompson (Indianapolis) questioned the accuracy of one of the cases cited, in which there was reattachment of a detached retina. He also asked regarding the use of gelsemium. Woods, in closing the discussion, agreed with Pyle as to the danger of pilocarpin, but said that some risk always had to be assumed to bring about definite results. He acknowledged a susceptibility in some cases and in others a marked tolerance for pilocarpin. He advised great care in its use. Age should be considered, patient should be kept in bed, and small doses should be used at first. He then cited the conditions in which diaphoresis was of greatest value. Woodruff, in his closing remarks, said he had seen no bad effects from the hypodermic injection of gr. 1/10 to 1/8 of pilocarpin. He also stated that he had found the hot bath at home to be unsatisfactory.

SECOND SESSION.

Is Bilateral Operation for Cataract ever Justifiable, and if not, How Soon after the Operation on the First Eye is it Safe to Extract the Second Cataract?

A. W. CALHOUN (Atlanta, Ga.) read a paper with this title and referred to a circular letter he had sent to 57 American ophthalmologists to determine this question. He briefly

stated the replies, which were equally divided on both sides of the question. He quoted cases in which anomalous healing, infection, and other complications affecting the first eye would have been more serious in prognosis had both eyes been operated upon at the same sitting. He also cited cases in which unfavorable results followed the bilateral operation and cases in which the eyes were operated upon separately, with a bad result in the first eye and a good result in the second at a much later period. He thought the dangers from temporary mental perturbation, sneezing, coughing, etc., were of more serious import following the bilateral operation. Personally he would not submit to the bilateral operation and said he believed it to be unjustifiable for the following reasons: The danger and numerous sources of infection; the menace to the eye through the occasional anomalous healing process of the corneal wound; the peculiarly helpless condition of the patient with double extraction, and the depression of spirits in the event of serious inflammation retarding recovery; the great advantage and value of the experience gained by the single operation; the various accidents followed by a possible sympathetic inflammation which necessitate enucleation of the eye upon which the operation is performed; and the disturbed mental condition, such as hallucination, acute mania, etc., that may arise and retard the healing process. He also gave a number of sound reasons why the second cataract should not be extracted at all if the first operation was successful. He never urges the second operation when the first is successful unless the patient especially desires it; then, if at the end of six or eight weeks there is an entire subsidence of inflammatory symptoms, the second operation is performed.

Discussion was opened by J. M. RAY (Louisville, Ky.) who agreed with the essayist as to the unjustifiability of the operation and stated that it was seldom necessary to consider the procedure, as few cataracts mature at the same time. Usually one is mature before the other. He had never performed the bilateral operation, but saw no reason why the second eye should not be operated upon eight days after the first if the patient so desired it, and there were no inflammatory symptom. He objected to the bilateral operation in patients over 70 years of age. J. L. Thompson, Indianapolis, related his early experiences with the

bilateral operation and the good results he obtained, but stated that now he prefers not to consider the operation except under certain circumstances. He urged the necessity of iridectomy and especially a preliminary iridectomy in all cases. H. A. Hansell, Philadelphia, said he had operated upon twelve cases bilaterally with encouraging results, and that he could see no greater danger in the double than in the single operation with the usual precautions. He always consulted the desires of the patient in the matter, allowing him to share the responsibility. S. B. Muncaster, Washington, also discussed the paper, giving his opinion and results in the operation. P. A. Callan, New York City, believed Calhoun to be too radical in condemning the operation, and stated that he had frequently performed the operation without bad results. He always operates thus if the patient desires it and the cases are uncomplicated. He thinks the patient should be given all the vision possible. Clark, Columbus, Ohio, did not think the patient's desires should influence the question of operation, and believed that the surgeon should decide the matter on his own judgment, as the responsibility rested entirely with him. Thorpe took part in the general discussion, and asked the essayist if he had ever performed the bilateral operation on a patient 40 years of age for congenital cataract. Calhoun, in closing the discussion, remarked on the unanimity of opinion concerning this operation. He stated that at one time he operated bilaterally, with success, but seeing a case of failure in the hands of a colleague, has since deterred him from employing this procedure. He thought the period of eight days suggested by Ray was too short, and believed a period of six to eight weeks was none too long. He recalled no case of bilateral extraction for congenital cataract in a patient of 40 years. He then related the histories of several cases of traumatic cataract and showed their relation to the bilateral operation.

Reclination of the Lens, under Certain Conditions a Justifiable Operation.

F. T. ROGERS read this paper which consisted of a definition of the operation and various forms of couching, together with a brief history of the procedure and the various

methods employed by regular and irregular surgeons. He quoted statistics from various sources and reported several cases with favorable results. He also made a comparison of the results following traumatic dislocation of the lens. The essayist made reference to a circular letter he sent to 73 leading ophthalmologists concerning the operation of reclinacion and tabulated their opinions with a view of determining whether or not the operation was justifiable and the conditions in which it may be of value. The reader then recited the history of a case in which one eye alone was present and was cataractous and other operative measures were impracticable on account of an intractable conjunctivitis and dacryocystitis. Six months after the operation of reclinacion vision was fairly good but the result at the end of a year was not so good. Neuralgia was present as a complication. He concluded from his observations that in cases in which opening of the eyeball for the extraction of the lens was contraindicated for any reason that this operation should be at least considered.

Discussion was opened by L. W. Fox, Philadelphia, who stated that he rejected the operation on account of the great liability to be followed by glaucoma and iridocyclitis which complications more than overbalance its good results. He urged treatment of the conjunctival and lacrimal conditions over a much longer period and the employment of less strong solutions. He advised in intractable cases with cataract, ligation or extirpation of the sac and then removal of the lens by extraction. He briefly referred to his antiseptic technic in the preparation of the patient for the operation, stating that it was especially applicable to these cases. He applies gauze pads saturated with a 1 to 5000 bichlorid of mercury solution to the eyelids continuously for several hours before the operation, and immediately before the operation he thoroughly flushes the cul-de-sac with sterile boric acid solution by means of a pipette connected to an irrigating bottle by means of rubber tubing. He also made mention of Mauthner's method of reclinacion and stated that he spoke of it only to condemn it. He said he was opposed to the routine practising of the procedure and to teaching of it as such, but would be slow to criticise it in individual cases taking into consideration the

personal equation of the operator. H. V. Würdeman, Milwaukee, said he was convinced that it should be rejected and did not think that conjunctival and lacrimal disease to be sufficient indications for its performance as he feared puncture of the eye in these cases more than corneal section. He had only seen one case in which reclination was indicated. In this instance nature had performed a partial reclination in one eye and he then performed a complete reclination in the other eye, holding the lens down for five minutes, and obtained good results. J. R. Thompson, Indianapolis, stated that in fluid vitreous in which nothing else was practicable he had performed it with gratifying results, but preceded it and other cataract operations with a preliminary iridectomy. Park, Harrisburg, mentioned a case in which reclination was accidentally performed during an attempt to perform the extraction operation. The results were good and had remained so for 8 years and the patient was thinking of having a similar operation on the other eye. S. D. Risley, Philadelphia, related the history of a colored man on whom a surgeon reclined the lens on the roadway with an ordinary needle; 12 years later he consulted Risley and then had fluid vitreous, floating lens, atrophic chorioiditis, and extremely poor vision almost to the degree of blindness. He believed that atrophic chorioiditis was a common sequel in all these cases. In closing the discussion, Rogers stated that he thought the cases in which it was indicated were very rare, but they did exist. He accepted the dangers and complications mentioned as possible, but he thinks the individual features of each case should be considered. In response to Risley, he doubted whether the chorioidal condition had not previously existed.

The chairman, RANDOLPH, then introduced A. MAITLAND RAMSAY, of Glasgow, Scotland, who by special invitation, read a paper entitled

The Importance of General Therapeutics in the Management of Ocular Affections.

Ramsay, in this paper, first briefly referred to the tendency to specialize, due to natural progress and limitations in all fields of study, but believed that the true specialist was one

having broad and comprehensive views of general medicine, and surgical dexterity especially applicable to his individual field. To his mind, the specialist should aim to keep in touch with the advances in pathology. He urged the avoidance of early specialism, as by so doing there was a loss of proper perspective and necessarily distorted judgment. There was undoubtedly a risk of such a specialist ignoring general principles. In his opinion, local treatment should have only its proper recognition. As an example of the influence of general conditions, he mentioned the necessity of general treatment in cases of corneal ulcers occurring in unhealthy individuals. He referred to Pasteur's work, and also to Welch's Huxley lecture for 1903. He stated to the effect that the healthy body was capable of producing substances antagonistic to microorganisms, and that in the unhealthy body aided in the formation of substances which increased the ill-effects of the microorganisms. The general treatment should, therefore, be a part of every preparatory treatment, supplemented by local antiseptic measures. He advised looking after the general health and improving the nutrition in broken-down individuals as a means of preventing suppuration after cataract operations. He also thought no operation for imperfections in the muscle-balance of low degree should be performed until the general health was restored, as they were frequently intensified by general conditions. He mentioned the fact that a disease can often cure itself, but referred to the term "constitution" as a cloak for ignorance. He cited Ehrlich's chain theory as the most intelligent expression of the forces of health and disease. As examples of the influence of general conditions, the ocular complications of measles and the occurrence of myopia in agriculturalists were mentioned. The importance of prophylaxis by increasing the resistance of the vital forces by antitoxins, fresh air, pure water, sanitary drainage, etc., was also forcibly brought out. He believed that serum treatment would come further to the front, and that it may yet serve to prevent sympathetic ophthalmia. He emphasized the correction of ametropia in children, not alone but together with care of the general health, measures to strengthen all the muscles, outdoor life, exercise, etc. Ramsay also dwelt on the supreme importance of recognizing fatigue, and of supplying the necessary remedy, rest. He said that often slight degrees of ametropia would be of no moment if the general condition was improved, and stated his belief in a close connection between ophthalmology and general medicine and surgery. The eye, he said, was not only in, but of the body, and required a physician's skill in its treatment. He insisted on the early treatment of eyestrain. A knowledge of the natural history of disease was necessary for its removal, in his opinion. Disease should not be considered as an entity,

but rather as a perversion of natural processes. With such ideas in mind, the prevention and relief of disease was rendered easy. The necessity of proper food was also emphasized. The elements of absorption, metabolism, assimilation, elimination, etc., should be remembered as influencing nutrition, and consequently, the resistance to disease. RAMSAY cited phlyctenular disease as an example of the reflection of general nutritional disturbances through the eye. He believed that many of these cases had inherited a lowered resistance, and this, together with the unsatisfactory environments, gave rise to the so-called scrofulous condition; although it was often impossible to demonstrate tubercle bacilli, the vulnerability of these individuals was undoubted. He also made mention of the tendency to recurrence in phlyctenular disease, unless the general condition is considered in the treatment. The alternation of disease of the eye, ear, skin, and mucous membranes in this class of cases was likewise remarked, as was also the possible engrafting of tuberculosis. The real treatment should be constitutional, and should include attention to the diet, nightly warm baths, wearing of woollen nightgown, diaphoresis, etc. The administration of tartar emetic in slightly nauseating doses preferably with purgatives, especially rhubarb, was advised and if the tongue was brown, gray powder should be employed. He insisted upon the avoidance of dieting indiscretions and repeated the fact that the return of disease is not uncommon if the proper internal treatment is not continued sufficiently long. He recommended sending such a child to the country, preferably where a high, dry, bracing air could be obtained. Open air was very essential. The seashore should be avoided. Restorative methods are only of value after proper assimilation of food is brought about. He thinks phosphorus, cod-liver oil, iron, etc., should not be prescribed until the stomach is in good condition. Some constitutional factor should always be sought for first and appropriately treated. He did not consider the individual remedies favorably when they interfered with the stomach and considered that the combinations should be carefully varied to suit the individual peculiarities. Ramsay did not look with favor on the indiscriminate use of remedies advocated by the large drug companies and thought that the physician is only in control of the disease when he directs his own prescriptions and dosage. He referred again to the great importance of rest and especially to the beneficial results following sleep after cataract operations and to insure this he routinely administers the triple bromids before the operation, recognizing the great disadvantage of restlessness. Pain after operation he believed to be a great disadvantage by the restlessness it induced. In many instances it was of great advantage in indicating the character of the complication

present and he mentioned the blepharospasm induced by the pain following exposure to light in certain conditions. The rest produced by atropin often served to relieve pain. The essayist stated that more knowledge of therapeutics was not necessary but rather a better application of the knowledge already extant was needed. He believed that retrospection was of great value in guiding us in the future. He also observed that the clinical experience and teaching of the founders of ophthalmology were in many respects equal to those of the present period. On motion of BULLER a rising vote of thanks was tendered Ramsay on conclusion of his paper. E. J. BROWN (Chicago) then showed several illustrations from Ramsay's book on the screen by means of the Hoy Opaque Projector, without removing the sheets from the book. Ramsay then responded to the vote of thanks.

Septic Thrombosis of the Cavernous Sinus, with a Report of Three Cases.

E. C. ELLETT (Memphis, Tenn.) read this paper, mentioning the reasons why the attention of ophthalmologists should be drawn to this condition, the eye symptoms, particularly exophthalmos, often being among the very early manifestations. He referred to the extreme rarity of the affection and to its bibliography. He also gave a detailed history of three cases and emphasized the necessity of diagnosis on account of the grave prognosis. As general symptoms, septic manifestations were mentioned, and as local symptoms, exophthalmos, cyanosis of the lids and orbital region, various visual and motor disturbances due to pressure on the nerves, and ophthalmoscopic appearances such as retinal edema and venous congestion. He stated that the affection was unilateral at first, but later became bilateral. Edema of the lids was considered as an extremely important symptom. The prognosis was uniformly bad in septic cases and operative treatment, which was then thoroughly discussed, was mentioned as offering the only hope of saving life.

Discussion was opened by S. D. RISLEY (Philadelphia) who said he thought that the condition frequently escaped recognition. He referred to the well-known danger that attended abscesses of the face and believed that it was not improbable that there existed a connection between them and the cavernous sinus. He then cited a fatal case of facial abscess. He also related an instance in which small abscesses in the malar bone were followed by severe headache, edema of the eyelid, exophthalmos, proptosis, and violent pain which was aggravated by both heat and cold. Leeches failed to extract blood in this case and mechanical means had to be employed. The abscess was pea-sized and when opened and the pus

was examined it was found to contain streptococci. Exploration of the orbit under ether revealed no pus. The pain became worse and was relieved only by morphin, hypodermically. Coma and death occurred within 3 days. The entire duration of the case was only 5 days. He called attention to the fact that the lesion occurred in the area drained by the cavernous sinus. PREFONTAINE (Springfield, Mass.) related a case of mastoiditis in which swelling of the lids, exophthalmos, double cavernous thrombosis, and death occurred. MILES (Bridgeport, Conn.) gave an account of a case which began as small nasal abscesses of staphylococcic origin with apparent thrombosis of the sinus. In closing the discussion Ellett remarked that all cases with acute exophthalmos did not necessarily indicate sinus involvement but that the symptom might arise from orbital cellulitis and facial erysipelas and that it was therefore somewhat misleading.

S. D. Risley moved that the section's delegate, Casey A. Wood, be instructed to present the name of A. Maitland Ramsay, Glasgow, Scotland, to the House of Delegates for honorary membership in this section. The motion was carried and the delegate was so instructed.

The Conservative Treatment of Affections of the Lacrimal Apparatus.

S. D. RISLEY (Philadelphia) presented this paper. He reviewed the anatomy of the lacrimal apparatus and showed wherein the surgical methods usually employed ignored this factor in the treatment. The nasal duct, he stated, was never entirely patulous. The passage of the tears was brought about by capillary attraction, gravity, and the pressure induced by winking. Obstruction was usually due to swelling of the mucous membrane. He then remarked that all surgical interference, which impaired the physiologic function of the drainage system should, as far as possible, be avoided. His treatment consisted first in the instillation of cocaine and adrenalin, after which a small probe could be introduced or better the cannula of an especially constructed syringe could be entered and the duct irrigated. Irrigation he thought to be of greatest value, using peroxid of hydrogen and silver nitrate in acute cases, and iodine and similar stimulating applications in chronic affections. Frequently he employs irrigation alone. He cautioned against probing, as usually employed on account of the injury that might result. In his opinion, Bowman, Nos. 3 or 4, was most practicable, the smaller probes being rather dangerous. Not infrequently he precedes syringing by slitting the canaliculus with a Weber's knife, being careful not to carry the incision into the sac and

thus slit the common canal, the maintenance of the integrity of which he considered highly essential. As an argument against forcible dilation by large probes, he laid great stress on the normal variation in anatomic relation of the nasal duct. He also plead for a careful examination of the mucous membrane of the nasal cavities and adjacent sinuses in all cases. He stated, however, that while a relation existed between them, lacrimal disease was disproportionately less than nasal disease, due in all probability to the natural situation and direction of the canal and its drainage. When distorted, disease was likely to occur. He then exhibited an all-metal lacrimal syringe with a metal collar for its support, provided with a short curved hollow needle. He stated that in his experience, forcible dilation, cutting operations involving the lining tissues of the long nasal duct, or extirpation of the lacrimal sac have rarely proved necessary when seen at first hand, and conservative methods, such as irrigation, were employed.

Discussion.—G. E. DE SCHWEINITZ (Philadelphia) who agreed with Risley in many respects, did not think favorably of too much probing. He said that one should carefully consider whether the cause of the epiphora was lacrimal or due to some condition in the nasal duct, or at its lower extremity. He believed that when true dacryocystitis was present, extirpation of the sac should be the only treatment. L. C. BROSE (Evansville, Ind.) considered that conservative treatment was contra-indicated when there was only one eye or when the affection was bilateral with continually inflamed sacs and corneal ulcers, and thought extirpation was the proper treatment in such cases. L. CONNOR (Detroit) stated that he had discarded metal syringes and used the ordinary medicine dropper in irrigating the sac. In intermittent or recurring cases he passes large probes, and has noticed that they passed relatively easy without any bad results and with a satisfactory cure. SUTPHEN (Newark) said he thought the convexity of the probe should be turned toward the nasal side. He also asked for information regarding the treatment in cases in which the lower punctum was absent. BERNSTEIN (Baltimore) cited cases in patients and in dried skulls, in which the passing of probes was impossible. In some instances he has found polypoid degeneration of the inferior turbinal as a cause of the disease. He said he practised extirpation of the sac, enucleating it entire, without first slitting it. THEOBALD (Baltimore) stated that he still believed in the efficiency of probes, and thought that while the punctum, canaliculus and valves were normal, they were not necessary for drainage. He referred to the good results following slitting of the canaliculus, and said he preferred the use of probes in suppurative caries of the duct to extirpation of sac. E. E. HOLT (Portland, Me.) quoted various different

opinions in treatment of lacrimal conditions, and agreed to a great extent with Risley. In suppurative cases he said he routinely slits the canaliculus, passes a large probe, and after its removal introduces a lead style, which is worn for a variable period to avoid repeating probing. W. H. WILDER (Chicago) stated that he performs the radical operation in obstinate cases, and thinks it is of great value. He injects paraffin having a melting point of 112 degrees Fahrenheit, into the sac, and then applies ice to solidify it, after which the sac is excised. In closing the discussion RISLEY conceded that the probe was of value only when the duct was very large, but preferred the conservative plan of treatment. The repeated passing of large probes he designated as cruel surgery, considering the crushing they occasion. He did not cut the common canal, as he thought such a procedure would later be followed by a cicatrix, especially if probed. The repeated passing of probes and use of styles often served to keep up the irritation, which when ceased, allowed the disease to subside. In acute dacryocystitis, the treatment he employed was antiphlogistic and unirritating.

The Mathematical Points of Reversal in Skiascopy.

SWAN M. BURNETT (Washington, D. C.) read this paper, in which an endeavor was made to show that mathematically the point of reversal must lie at the nodal point of the observer's eye. Diagrams were presented which served to strengthen the argument materially. The essayist briefly reviewed several well-known optical facts, and showed that in all published studies of the fundamental laws of skiascopy there was apparent lack of accuracy in placing the point of reversal. He remarked on the very vague and indefinite theories as to its location, and especially considered the one in which the point of reversal was placed in the pupil of the observing eye.

Discussion.—J. E. JACKSON (Denver) agreed with Burnett that the nodal point and not the pupil was the point at which the reversal takes place. Previously he had used the pupil to indicate the approximate location of the same, but had not considered it as the exact location. He blamed the confusion that had arisen concerning this point to the imperfections in the methods of expression, particularly as regards confusion of the image with the object. He also stated that it was of great practical importance to follow the mathematics of this question to acquire a working capacity for the facts, especially in the shadow test. STEVENSON (Akron, Ohio) believed that the point of reversal could only be at the nodal point when it corresponds to the pupil of the eye, and illustrated this by means of a diagram. He also showed

that raising and lowering of a light without tilting it, affected the point of reversal, and drew another diagram to illustrate this point. He further stated that if the observer could dilate the pupil it would always be at the point of reversal. In closing the discussion, BURNETT strongly emphasized the point he had previously made, that the point of reversal must lie at the nodal point of the observer's eye.

The Chairman then directed the secretary to read the letters from the Reed Memorial Committee relative to collecting of funds for the same.

(To be concluded.)

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

Beginning with the October issue Dr. James Moores Ball, of St. Louis, becomes managing editor of the *ANNALS*.

Dr. Charles A. Oliver, of Philadelphia, is in England attending the meeting of the British Medical Association.

The Tenth International Congress of Ophthalmology will be held in Lucerne, Switzerland, September 13-17, 1904.

Dr. Samuel Lewis Ziegler, of Philadelphia, was married to Miss May Webster, at Painted Post, New York, on June 28th.

Sir Anderson Critchett and Mr. Priestley Smith have been made honorary members of the Gesellschaft der Aerzte of Vienna.

Dr. M. Uribe-Troncoso, editor of the *Anales de Oftalmologia*, Mexico, has joined the editorial staff of the *Ophthalmoscope* (London).

A new French ophthalmic journal, *L'Ophthalmologie provinciale*, comes from Tours. It is edited by Drs. Chevallier, Cosse, and Motais. We wish it a successful career.

Dr. Oscar Dowling, of Shreveport, La., recently visited the World's Fair City. At the last meeting of the Louisiana State Medical Society Dr. Dowling was elected Third Vice-President.

Mr. A. Maitland Ramsay, Glasgow, Scotland, by special invitation, addressed the Ophthalmic Section of the American Medical Association at its annual meeting held in Atlantic City last month. His subject was "The Importance of General Therapeutics in the Management of Ocular Affections."

Dr. R. F. Harrell, of Ruston, La., Chairman of the Section on Ophthalmology of the Louisiana State Medical Society, read an interesting paper on "Dacryocystitis," which appeared in the July number of the New Orleans Medical and Surgical Journal. Drs. H. D. Bruns, R. W. Salter and M. Feinogld, of New Orleans, took part in the discussion.

Mr. Percy Flemming has been appointed Professor of Ophthalmology and Ophthalmic Surgeon to University College (London). Mr. J. H. Parsons has been appointed Assistant Ophthalmic Surgeon to the same institution. Mr. John Tweedy, who has so long and ably served the University College, becomes Emeritus Professor.

Professor Carl de Vincentiis, of Naples, died in that city on May 12, 1904, at the age of 55 years. In 1877, he became professor extraordinary at Palermo, and ten years later he was called to Naples. He made many contributions to ophthalmic literature, of which we may mention monographs on ocular leprosy, chalazion, intraocular cysticercus, aneurism of the orbit, and xanthoma of the eyelids.

William Alexander McKeown, of Belfast, died July 9th, 1904. After a distinguished collegiate and university career he graduated in 1869, securing the gold medal and first class honors. He studied ophthalmology in Paris for one year, after which he located in Belfast. His first original contribution to ophthalmic surgery was the introduction of the magnet for removal of particles of steel from the interior of the eye. He wrote on aural and throat surgery, but his chief contribution was to ophthalmic literature in the form of a "Treatise on Unripe Cataract," which appeared in 1898.

THE OPHTHALMOSCOPE, Sydney Stephenson's journal is fast becoming one of the best and most popular of ophthalmic journals. It is a monthly publication, in octavo form, of about 40 pages of reading matter. It is well printed and presents a handsome appearance. Each number contains original communications: clinical, pathological and therapeutical memoranda; abstracts of current literature; book reviews; correspondence; and notes and echoes. The mat-

ter is well edited. The *Ophthalmoscope* is now in its second volume. It is published by Messrs. George Pulman & Sons, Ltd. 24-26 Thayer Street, London, W. The subscription price is, 10/6 in England, and about \$3.00 in the United States.

The American Academy of Ophthalmology and Oto-Laryngology will hold its ninth annual meeting in Denver, Colorado, August 24, 25 and 26, 1904. The following ophthalmic theses and papers are already promised and doubtless several others will appear on the working program:

I.—Theses:

HUBBELL, DR. ALVIN A., Buffalo, N. Y.

"Samuel Sharp; The First Surgeon to Make the Corneal Incision for Cataract Extraction with a Knife."

RANDALL, DR. B. ALEXANDER, Philadelphia.

"The Real Principle of Test-Type Construction."

DE SCHWEINITZ, DR. GEORGE E., Philadelphia

"Metallic Foreign Bodies within the Eyeball and their Removal—A Clinical Account of Twenty-six Operations of that Character."

WEEKS, DR. JOHN E., New York.

"Remarks Concerning Some Parts of the Technique of Mules's Operation; the Handling of Thiersch Grafts and the Advancement of the Recti Muscles."

II.—Papers:

ALT, DR. A., St. Louis, Mo.

Lantern Demonstration on "Glioma and the Question of Rosettes."

BALL, DR. JAMES MOORES, St. Louis, Mo.

"The Book of George Frick, the First American (1823) Text-Book of Ophthalmology."

BRADFELD, DR. J. A. L., LaCrosse, Wis.

"Further Experience and Treatment of Keratoconus."

BUCKWALTER, DR. J. C., St. Louis, Mo.

"Removal from the Lacrimal Duct of a Style which Had Been Buried Seven Years—Almost Fatal Hemorrhage."

BULSON, DR. A. E., JR., Ft. Wayne, Ind.

"The Toxic Amblyopias, with Special Reference to Those Produced by Tobacco and Coffee."

BULLARD, DR. J. W., Pawnee City, Neb.

"The Use of Pure Nitric Acid in the Treatment of Diseases of the Eye."

COLBURN, DR. J. ELLIOTT, Chicago, Ill.

"Cases of Retinitis Pigmentosa."

FRYER, DR. B. E., Kansas City, Mo.

"Remarks on the Need for Thorough Aseptic and Antiseptic Work Prior to, During, and after Cutting Operations on the Eyeball."

GIFFORD, DR. H., Omaha, Neb.

"The Safest Operation for Senile Cataract."

GREENE, DR. D. W., Dayton, O.

"Some of the Accidents and Complications Met With in the Extraction of Cataract."

GRIFFIN, DR. O. A., Ann Arbor, Michigan.

"Changes in Refraction."

HOOD, DR. THOS. C., Indianapolis, Ind.

"Notes on the Use of Dionin."

KIRKPATRICK, DR. S., Selma, Ala.

"A Case of Unilateral Nystagmus, with Remarks on the Probable Cause."

MOORE, DR. T. W., Huntington, W. Va.

"Some Unique Cases of Amblyopia."

SCHNEIDEMAN, DR. T. B., Philadelphia, Pa.

"Central Superficial Chorioiditis."

SMITH, DR. EUGENE, Detroit, Mich.

"Removal of Anterior Capsule and the Hypodermatic Use of Morphia in Simple Extraction."

SUKER, DR. G. F., Chicago, Ill.

"A Criticism on the Use and Abuse of Lacrimal Probes."

WOOD, DR. CASEY A., Chicago, Ill.

"How Shall We Educate Our Blind Children?"

III.—President's Address:

DR. EDWARD JACKSON, Denver, Colo.

Subject: "Education for Ophthalmic Practice."

The officers of the Academy are: Dr. Edward Jackson, President, McPhee Bldg., Denver, Colo.; Dr. Dudley S. Reynolds, 1st Vice-Pres., Louisville, Ky.; Dr. J. J. Kyle, 2d Vice-Pres., Indianapolis, Ind.; Dr. John W. Murphy, 3d Vice-Pres., Cincinnati, O.; Dr. Derrick T. Vail, Secretary, 4 West 7th St., Cincinnati, O.; Dr. O. Stein, Treasurer, 100 State St., Chicago, Ill.

BOOK NOTICES.

The Ophthalmic Year-Book.

JACKSON, EDWARD, A. M., M. D., Emeritus Professor of Diseases of the Eye in the Philadelphia Polyclinic, etc. With 1 colored plate and 45 illustrations. The Herrick Book and Stationery Company, Denver, Colorado, 1904. Pages, - 260, octavo. Price, \$2.00.

In this volume Dr. Jackson has attempted to furnish a critical digest of the most important literature of the past year, and also to give a list of the most important original communications which have appeared during that period. The digest of the literature is arranged under the following headings: Refraction, accommodation, ocular movements, diseases of the conjunctiva, diseases of the cornea, diseases of the sclera, the pupil, diseases of the uveal tract, diseases of the retina, diseases of the optic nerve, toxic amblyopias, diseases of the crystalline lens, diseases of the vitreous, glaucoma, the lacrimal apparatus, diseases of the lids, the orbit, tumors, injuries, sympathetic diseases, general ophthalmology, and general operative measures. A list of books and of journal articles appearing during the year 1903 is appended. The volume contains 45 text illustrations and 1 colored plate.

The talented author has succeeded in giving the profession a volume of the greatest value.

New York Eye and Ear Infirmary Reports.

New York Eye and Ear Infirmary Reports, Vol. XI, January, 1904. Octavo, 96 pages. The Knickerbocker Press, New York (G. P. Putnam's Sons). Price, \$1.50.

This is an unusually interesting number, containing thirteen articles, of which twelve deal with ophthalmic subjects.

I. Dr. Emil Gruening describes the "Treatment of Various Forms of Ptosis by Partial Resection of the Tarsal Cartilage." This operation is somewhat similar to Gillet de Grandmont's procedure.

II. Dr. John E. Weeks writes on "Deposit of Silver in the

Epithelial Layer of the Cornea." This case seems to be unique in ophthalmic literature.

III. Dr. D. W. Hunter gives the history of a "Case of Tuberculous Iritis," occurring in a girl seven years of age.

IV. Dr. H. H. Seabrook contributes a paper on "Amber-Yellow Glass in the Examination and Treatment of the Eyes."

V. Dr. Wilbur B. Marple gives an account of "The Treatment of Some Cases of Detachment of the Retina by the Method of Dor." In 1899 Professor Henri Dor, of Lyons, reported nine cures of detachment of the retina out of fifteen cases. The treatment consists in the free cauterization of the sclera (the globe not being perforated) and in the simultaneous subconjunctival injection of sterile solutions (20 to 30 per cent.) of chlorid of sodium. In addition to these measures the patient is made to rest in bed and blood is extracted by means of the Heurteloup artificial leech. Such is the method of Dor. Marple's experience with it has been unsatisfactory.

VI. Dr. Percy Fridenberg writes on "Sclerosed Nerve Fibres Following Retinal Traumatism; a Hitherto Undescribed Ophthalmoscopic Picture," and gives full illustrations of the condition.

VII. Dr. R. Denig reports a case of "Family Unilateral Hyperidrosis."

VIII. Dr. Ernest Krug contributes a good paper on "The Black Spot at the Macula Lutea in Myopia."

IX. Dr. Julius A. Gehrung has written on "The Diseases of the Optic Chiasm." This is the largest and in some respects the most valuable paper in the present number. One hundred and two cases have been collected.

X. Dr. R. H. Wright furnishes a "Summary of Cataract Operations Performed at the New York Eye and Ear Infirmary for the past two years, ending September 30, 1903." Of the 247 cases included in this tabulated report, 210 were mature senile cataracts, 7 immature senile, 5 hypermature senile, 6 traumatic, 3 complicated, 1 sclerosed, 1 lamellar, 2 glaucomatous, 2 Morgagnian, 2 congenital, 1 diabetetic, 1 black, 1 capsular, 2 high myopia, and 3 dislocated lens.

This number closes with (XI) the "Report of a Case of Brain Abscess," by Dr. J. F. McKernon, with (XII) "Hospital

Statistics," and (XIII) with the "Report of the Pathological Department for the Year ending October 1, 1903," by Dr. George S. Dixon.

Modern Ophthalmology: A Practical Treatise on the Anatomy, Physiology, and Diseases of the Eye.

ALL. JAMES MOORES, M. D., Professor of Ophthalmology in the St. Louis College of Physicians and Surgeons. With 417 illustrations in the text, 2 plates in black and white and 21 plates in colors. Extra royal octavo, pp. xxii—820. Price in cloth \$7.00; in half-morocco \$8.50 net, delivered. Philadelphia: F. A. Davis Company, 1904.

It has been many years since as valuable a text-book as Ball's "Modern Ophthalmology" has been offered to the ophthalmic profession. A work of such magnitude and one which evidently has been prepared with so much care, deserves more than a perfunctory review. Its pages tell the story of months, possibly of years of toil on the part of the author; and of lavish expense by the progressive publishers. The result is a work which will live and will be a credit to author, to publisher and to the American profession.

The author states in the preface that in writing this treatise his "aim has been to produce a work which shall teach, and which shall be valuable alike to the medical student, to the general practitioner, and to the specialist."

The arrangement of subjects, which differs from that found in other books, is explained as follows: "Regarding the arrangement of subjects, the author's experience as a teacher of ophthalmology has led him to believe in the advisability of combining embryology, anatomy, physiology and diseases of the eye within one volume. In the clinical portion of the treatise congenital anomalies, tumors, inflammations and degenerations, injuries, and operations have been considered in the order mentioned. This is believed to be a logical sequence."

Ball's Modern Ophthalmology consists of twenty-five chapters. The author wrote nineteen chapters. He found that the time-limit granted by the publisher was too short to enable him to finish the work single-handed. In this emergency, "the author called several well-known ophthalmologists to his aid, all of whom responded courteously." Thus six chapters have been contributed.

Chapter I., Development of the Eye, consists of seven pages. It describes the essential facts of the embryologic history of the eye in a lucid manner. The recent researches of Lenhossék on the origin of the vitreous humor are mentioned.

Chapter II., Anatomy. Fifty-three pages are devoted to this subject. The text is clear and numerous illustrations (several of which are original) add to the value of this chapter. A coronal section of the head (made by Dr. John W. Murphy, of Cincinnati) showing the orbits and adjacent parts is excellent. The normal fundus is described in this chapter and colored plates II, III and IV—all of which are original—and plate V (Johnson) are of great value to the general practitioner and to the beginner in ophthalmology. Among the text illustrations we must mention Fig. 46, a photograph of the chiasma showing the decussation of the nerve-fibres, as a unique and excellent representation.

Chapter III., Physiology of Vision, comprising twenty-three pages, is well written. We note a paragraph on blindness during ocular movements which is not mentioned in any other text-book, so far as we know.

Chapter IV., Examination of the Eye, is complete, seventy two pages being devoted to this subject. External examination, ophthalmoscopy, the shadow test, X-ray examination, etc., are fully described. We note that mention is made of Jansson's siderophone.

Chapter V. Diseases of the Eyelids—sixty pages. Two pages are given to congenital anomalies. The dermatologic diseases to which the lids are subject are disposed of in twenty-eight pages. Many subjects not mentioned in other ophthalmic works (frambesia, Aleppo boil, blastomycetic dermatitis, congenital hyperkeratosis, solid edema, xeroderma pigmentosum, varicose veins, keratosis follicularis, etc.) are carefully described. Chalazion is defined as "not directly a cyst, but a mass of granulation tissue scantily supplied with vessels and tending to necrosis." "Histologically a chalazion is composed of typical tuberculous tissue, presenting numerous round cells, epithelioid cells, and occasionally a giant cell (Fig. 151)." "Fisch, of St. Louis, has demonstrated the presence of tubercle bacilli in giant cells found in chalazia." Plate VII, containing eight colored figures, shows distichiasis and trichiasis, chalazion, blepharitis, symblepharon,

ectropion, entropion, chancre of the conjunctiva (de Schweinitz) and epithelioma of the corneoscleral region (Oliver). This chapter concludes with an exhaustive account (twenty-four pages) of the operations for chalazion, ptosis, tarsorrhaphy, canthoplasty, trichiasis, entropion, ectropion, epicanthus and various methods of blepharoplasty.

Chapter VI., Diseases of the Lacrimal Apparatus, comprises twenty pages, and is an up-to-date account of these troublesome affections. The indications for operations on the lacrimal gland and excretory apparatus are clearly defined, and the technique of each operation is fully set forth. The author prefers Snellen's lacrimal probes. Of Theobald's instruments he says their "chief advantages lie in their length and in the gradual increase in size. The author believes in the use of the largest probes compatible with the integrity of the tissues, but he does not believe in the forcing of large probes into the duct."

Chapter VII., Diseases of the Conjunctiva, consists of sixty-three pages and is one of the most satisfactory chapters in the book. After mentioning congenital anomalies and devoting eight pages to conjunctival tumors, the author takes up the inflammations and degenerations of this tissue. The various conjunctivitis are described minutely. The fact is emphasized that not every purulent conjunctivitis is of gonorrheal origin. Nearly three pages are devoted to vernal conjunctivitis, which disease, we are inclined to believe, is occasionally overlooked. The diagnostic tables found in this chapter will be of assistance to inexperienced ophthalmologists. The newer remedies, such as protargol, cuprol, argyrol, etc., are mentioned.

Chapter VIII., Cornea, is disposed of in fifty-eight pages. This is a thoroughly good chapter. The author gives a page and one illustration to aspergillar keratitis. The text-illustrations of punctate keratitis, ribbon-shaped corneal opacity, herpes febrilis, and of fistula of the cornea are excellent, while the colored pictures of pathologic corneas (Plate XII) have never been surpassed. Among the operations described in this chapter is Gayet's temporary renversement of a corneal flap, which we do not remember to have seen in any English work.

Chapter IX., Diseases of the Sclera, is a short chapter (thirteen pages) which includes the treatment of intraocular foreign bodies.

Chapter X., Diseases of the Iris, consists of thirty-one pages. Some capital illustrations of congenital anomalies have been inserted from de Beck's writings. Under the head of sarcoma, the differential points of melanoma, gumma, tubercle and melanosarcoma are presented. Cases of sarcoma are cited which were cured by iridectomy. "On the other hand, it may be impossible to determine whether the ciliary body is involved. Wood and Pusey, who have given the latest contribution on this subject, hold that an enucleat on should be made as soon as the diagnosis of iris sarcoma has been made."

Diabetic iritis is described and a photomicrograph is presented which shows proliferation of the pigment layer of the iris. Emphasis is given to the importance of recognizing senile iritis. Uveite irienne is distinguished from iritis by an arrangement of the symptoms in tabular form. Dionin is said to assist the mydriatic action of atropin, and to hasten the absorption of pupillary exudation. Under the heading of operations on the iris we notice that transfixion of the iris and iridenkleisis are described. Fig. 275, showing the instruments used in iridectomy, has an incorrect legend—the blunt hook and the *pince ciseaux* of de Wecker being tranposed.

Chapter XI., The Diseases of the Ciliary Body, comprises seven pages. Fig. 280, gumma of the ciliary body, is upside down.

Chapter XII., Diseases of the Chorioid. Twenty-six pages are devoted to this subject. There are two splendid plates in this chapter. Plate XIII shows (1) sarcoma of the chorioid, and (2) tubercles of the chorioid. Plate XIV shows (1) syphilitic chorioidoretinitis and (2) disseminated chorioiditis.

Chapter XIII., (thirty-six pages) is devoted to the Diseases of the Crystalline Lens. Naturally the subject of cataract claims a large portion of this chapter.

Chapter XIV considers diseases of the Vitreous Humor, eight pages being devoted to this subject.

Chapter XV., Diseases of the Retina, comprises forty-eight pages. The congenital anomalies are mentioned. Several pages are devoted to neuroepithelioma of the retina. The diagnosis of this condition is exhaustively considered. Following Wintersteiner the author gives the differential points between neuroepithelioma and: (1) simple detachment of the

retina; (2) leucosarcoma of the chorioid; (3) tubercles in the chorioid; (4) chronic inflammatory processes in the chorioid and ciliary body; (5) acute suppurative hyalitis; (6) cysticercus in the vitreous; (7) congenital abnormalities; (8) retinitis circinata; (9) detachment of the retina with dropsical degeneration of the visual (rod and cone) cells. This is a formidable list, but it will be gratefully accepted by any ophthalmologist who has had to assume the responsibility of deciding between a true and a pseudo-glioma. One of the strong points of Ball's *Modern Ophthalmology* is the thoroughness with which the subject of diagnosis is considered. Particularly useful are the paragraphs which describe diabetic and albuminuric retinitis. "In typical cases the diagnosis of albuminuric retinitis is not difficult, but it must be remembered that, while the ophthalmoscopic picture is highly suggestive, it is not pathognomonic, similar fundus changes being met with in rare instances in intracranial tumor, lead encephalopathy, pachymeningitis hemorrhagica, anemia, syphilis, and diabetes mellitus." Admirable colored plates are found in this chapter.

Chapter XVI deals with Diseases of the Optic Nerve. The tumors of this part are described under the headings: (1) primary intradural tumors (fibromatosis nervi optici, of Byers) and (2) primary extra-dural tumors of the optic nerve. Regarding the mechanism of papillitis the author gives preference to the theory of Sourdille. Hemorrhage into the sheath of the optic nerve is dismissed in a few lines. The author states that "there is no evidence to show that it exists as an idiopathic affection."

Chapter XVII deals with the mooted question of Glaucoma. "The author believes that primary glaucoma should be defined as a disease of the sympathetic nervous system producing increased intraocular pressure." The pathologic changes found in the superior cervical sympathetic ganglion, which the author was the first to report, are minutely described, as also are the intraocular alterations of structure. Speaking of the sympathetic nerve the author says: "While these changes are suggestive of the sympathetic origin of glaucoma, it must be acknowledged that similar pathologic lesions of the sympathetic nerve exist in optic-nerve atrophy and in exophthalmic goitre." The technique of excision of the cervical sympathetic is thoroughly described although

the operation is given preference over iridectomy only in the hemorrhagic type of glaucoma. Hancock's operation (large paracentesis of the sclerotic with cyclicotomy) is commended in certain cases of glaucoma.

Chapter XVIII., Sympathetic Eye Diseases—Indications for Enucleation—is one of the best in the book. The various sympathetic diseases are exhaustively described, the line being carefully drawn between sympathetic irritation and sympathetic ophthalmitis. The indications for the removal of an eyeball are clearly indicated and the methods of performing this and substitute operations are fully described.

Chapter XIX., Diseases of the Orbit, written by Dr. Wm. T. Shoemaker, of Philadelphia, is of exceptional merit.

Chapter XX., Anomalies of the Muscular Apparatus, was contributed by Dr. Wm. Zentmayer, of Philadelphia. The action of the muscles is first considered. The general symptoms of muscular anomalies are described and following this the special signs of the various paralyses are described in clear language.

Chapter XXI., Errors of Refraction, was written by Dr. John T. Kroll, of Philadelphia. This begins with a consideration of the optical properties of lenses, after which emmetropia is defined. The various types of ametropia are considered.

Chapter XXII., The Ocular Manifestations of Nervous Diseases, by Dr. J. C. Knipe, of Philadelphia, is a concise presentation of the subject.

Chapter XXIII., Preparation for Ophthalmic Operations, by Dr. Ball, is practical and to the point.

Chapter XXIV., Hygiene of the Eyes, by Dr. Harold G. Goldberg, of Philadelphia, gives valuable rules for the care of the eyes in infancy, during school-life and in old age.

Chapter XXV., Methods Employed in the Microscopic Examination of the eye, by Dr. W. E. Fischer, of St. Louis, gives the latest methods of preserving, fixing, cutting and staining ocular anatomic material.

The Index is complete.

In conclusion we must say that this book is an honest one. The author has endeavored to give credit to all who have contributed to the advancement of modern ophthalmology. This spirit is shown by numerous citations of the names of authorities in the text and index, and also in the matter of illustrations. Figures which have been taken from other au-

thors are duly credited. In this respect this work differs from some American books whose authors have "appropriated" not only woodcuts but also colored plates from German and French ophthalmologists.

Ball's *Modern Ophthalmology* deserves and doubtless will secure a wide-spread popularity.

Royal London Ophthalmic Hospital Reports.

Edited by WILLIAM LANG, F. R. C. S., Eng. Vol. XVI, Part I., June, 1904. London: J. & A. Churchill, Great Marlborough Street. Price 5 shillings.

This number contains five articles: two by Nettleship and one each by Treacher Collins, Parsons and Coats:

I. On Renal Retinitis in Young Subjects and on the Relative Frequency of Juvenile Interstitial Nephritis in the Two Sexes, by E. Nettleship.

II. Observations on the Prognostic and Diagnostic Value of Retinitis in Diabetes, by E. Nettleship.

III. Primary chancre of the Conjunctiva and Interstitial Keratitis, by E. Treacher Collins.

IV. The Innervation of the Pupil, by Herbert Parsons.

V. Thrombosis of the Central Vein of the Retina, by George Coats.

All the above articles are sufficiently meritorious to deserve careful study.

The Optical Dictionary.

Charles Hyatt-Woolf, F. R. P. S. An Optical and Ophthalmological Glossary of English Terms, Symbols and Abbreviations together with the English Equivalents of some French and German Terms relative to Physical, Physiological and Pathological Optics, Optical and other Instruments of Precision, and Terms descriptive of Color and Photo-chemistry, etc. Duodecimo, pp. 166. Philadelphia:

Blakiston's Son & Co., 1012 Walnut street, 1904. Price, \$1.00.

This little book, containing numerous terms which are not found in the standard medical dictionaries, is of practical value to the ophthalmologist.



GEORG BARTISCH (1535-1606).
The Father of German Ophthalmology.

THE ANNALS OF OPHTHALMOLOGY.

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PIGMENT STREAKS IN MACULA REGION OF BOTH EYES.

By J. ELLIS JENNINGS, M. D.,

ST. LOUIS.

Pigment streaks on the fundus are of such infrequent occurrence that I desire to place on record the following case:

W. G., a boy aged twelve, was referred to me June 6, 1904, by the family physician on account of nervous twitching of the lids. He is a slender, dark haired youth with blue gray eyes, bright and well advanced in his classes. Family history is good. Vision is 5/5 + in both eyes—Refraction under homatropine, was as follows. Right eye + 0.50 sph. \ominus + 0.25 cyl. ax. 90°. Left eye + 0.50 sph. \ominus + 0.37 cyl. ax. 90°.

Ophthalmoscopic examination: Media are clear, optic nerve head is a perpendicular oval, of normal color and clear outline.

The eye-ground is well colored with no chorioidal vessels in sight. The veins and arteries are of normal size and distribution and have well marked shot silk reflexes.

In the macula region the peculiar pigment markings shown in the drawings were found. The pigment streaks are of a dull reddish brown color and lie beneath the retinal vessels. They vary in length and width, often bend sharply and the borders are irregular and jagged.

Of exceptional interest is the band of pigment which completely encircles the fovea centralis.



Fig. 1. Appearance of fundus of right eye.



Fig. 2. Appearance of fundus of left eye.

Frost reports six cases of this peculiar condition, in most of which there was a history of trauma with impaired vision. Both Frost and Holden lean to the probability of a hemorrhagic origin. In the present case there was no history of injury to the eyes and the vision is normal.

THE PRECISE MEASUREMENT OF THE PRIMARY
AND SECONDARY DEVIATION IN PARALY-
SIS; WITH REMARKS ON THE REGULAR
OCCURRENCE OF SECONDARY
DEVIATION IN CONGENITAL
PARALYSIS.

BY ALEXANDER DUANE, M.D.,

NEW YORK.

In the ANNALS OF OPHTHALMOLOGY for October, 1903, I said, in speaking of the measurement of screen-deviation by prisms: "The correcting prism should be placed before the paretic eye. Otherwise we shall get too high an estimate of the deviation, since we shall measure, not the primary deviation of the paretic eye, but the much larger secondary deviation of the sound eye"; and I added: "By placing the correcting prism first before the paretic eye, then before the sound eye, we may actually institute a comparison between the primary and the secondary deviations—a comparison that may conceivably be of value in estimating the share that the paresis per se has in producing the deviation."

This surmise has since been verified by experience, which has shown that the precise measurement of the primary and secondary deviations by prisms may be in certain cases of diagnostic importance.

The application of the method is simple. Suppose, for instance, that we have a moderate paresis of the right external with a consequent inward deviation of the right eye. By passing a screen from one eye to the other we ascertain that each eye deviates in, but can not, perhaps, be sure that the deviation is, as we should expect, greater in the case of the left eye than of the right. We now place prisms, base out, before the right eye, until the inward movement behind the screen is just abolished. Suppose this to be effected by a prism 10° . Then, being careful to keep the head and eyes

in precisely the original position, we attempt to neutralize the deviation by placing prisms before the left eye instead of the right. If it now takes 15° to abolish the screen movement, we know that the secondary deviation of the left eye is about 1.5 times as great as that of the right, and that consequently the left is the more strongly-acting eye.

The test will be of equal value whether the sound or the paretic eye fixes and whether we are dealing with a case of paralysis or spasm. In either event, the more strongly-acting eye (the sound eye in case of paralysis, the affected eye in a case of spasm) will show the greater deviation.

The following cases illustrate the application of the test:

CASE I.—*Paralysis of Externus*.—James C., aged 11. Diplopia for one year, which came on suddenly without assignable cause. Avoids it by holding head to left. Paresis of L. externus, which can move only 2 mm. beyond mid-line. Typical diplopia. In the primary position no obvious difference between the primary and secondary deviation by inspection, but screen-movement is neutralized by a prism of 25° (representing a deviation of 14° of arc) before the left eye, and one of 35° ($=20.8^\circ$ of arc) before the right. I. e., secondary = 1.5 times primary deviation.

CASE II.—*Congenital Paralysis of Externus and Paresis of Internus*.—Minnie B., aged 16. Congenital paralysis (complete) of L. externus and paresis L. internus. Holds head directed slightly to right. In looking to right, left eye falls short of complete excursion by only 1-2 mm., yet in binocular vision always lags very greatly behind the right, so that there is a rapidly progressive, marked increase in the screen-deviation. In primary position moderate divergence. Primary deviation of left eye evidently less than secondary of right, and the screen-movement is neutralized by prism of 10° ($=5.4^\circ$ deviating power) before the left and 26° (14.8° deviating power) before the right.

After tenotomy of the right externus, esophoria of 3° (prism) in the primary position. When the eyes are carried to the right there is a moderate exophoria (7° - 9° prism) which does not increase as the eyes are carried still further to the right, and which is now by the screen-test the same for the right eye as for the left.

CASE III.*—*Congenital Paralysis of Externus and Paresis of Internus*.—D. Theodore K., aged 22. Case of same type as last, i.e., complete paralysis R. externus, moderate paresis R. internus. Increasing homonymous diplopia in looking to right, increasing crossed diplopia in looking to left. Holds head directed about 10° to the right (so that eyes are directed this amount to left). In this position esophoria and homonymous diplopia with red glass; screen-deviation $4-5^\circ$ if prism is placed before the right eye, $10^\circ-12^\circ$ if prism is placed before left. With the eyes directed straight ahead, esophoria as measured by the screen is 14° if the prism is placed before the right eye, 20° if it is placed before the left. So too, the outward deviation that develops when the eyes are directed to the left is much more pronounced for the left eye than for the right, when measured by the screen-test; and the same difference is noticed in the exophoria for near points, which is produced by the marked insufficiency of convergence, which is also present. Thus with the object of fixation at 10 inches the exophoria measured by a prism before the right eye is 12° , by a prism before the left is 18° .

CASE IV.—*Paresis of Externus*.—Frank K., aged 43. Paresis L. externus and L. inferior rectus with characteristic diplopia. Movement of left eye outward equals about three-fourths of the normal. Screen-deviation in the primary position equals 20° ($=11.1^\circ$ of arc) when prism is placed before right eye and 15° ($=8.2^\circ$ of arc) with prism before left eye. If eyes are turned slightly to the left it takes a prism of 30° ($=17.3^\circ$ of arc) before the right eye and 20° ($=11.1^\circ$ of arc) before the left to correct the deviation. I.e., primary equals rather less than two-thirds of the secondary deviation.

CASE V.—*Spasm of Internus in Convergent Squint*.—Annie C., aged 9. L. strabismus convergens, for which several operations have been done unsuccessfully, there being still a residual squint of slight amount, with homonymous diplopia. Movement of right eye inward somewhat excessive, of left eye a good deal so.

*I am indebted to Dr. C. H. May for the privilege of examining this case.

Deviation of eyes inward behind the screen is corrected by a prism 14° , base out, placed before the right eye, and 18° base out, before the left. This difference, although slight, seems to be a constant one, the prism that neutralizes the deviation when placed before the right eye, never appearing adequate to accomplish the same result when placed before the left.

Case II shows how the test in question can be utilized in gauging the effect of operations. In this case, before the tenotomy the secondary deviation was nearly three times as great as the primary; after the operation the primary and secondary deviations were equal.

Case V shows that the test may indicate an excessive deviation in a squinting eye due to overaction of the corresponding muscle. In a truly comitant squint, however great, the primary and secondary deviations should be equal. When, however, consecutive changes (contracture of one muscle, e.g., in this case the left internus, and stretching and weakening of its opponent) have taken place, the deviation in the eye with the contracted muscle will exceed the deviation in the fellow eye.

Now a squint due to a convergence anomaly, which is as yet uncomplicated by a one-sided muscular contracture or weakening and in which, therefore, the deviation may be regarded as still strictly bilateral, will be more apt to undergo spontaneous cure or, if not, will respond more readily to treatment with glasses than will a squint in which secondary, and especially unilateral muscular changes have developed. Hence it becomes important to ascertain whether or not such secondary unilateral muscular changes, producing a one-sided preponderance of action, have developed. Some have thought to determine this by measuring the monocular excursions with the tropometer. But measurements of the monocular excursions are in my experience variable, and anyhow afford little indication of the real differences existing between the eyes. An eye when tested by itself may make a maximum excursion which is fully equal to that of its fellow, and yet may lag considerably behind and show a marked relative weakness when the two eyes are examined together. I have seen this a number of times in cases of pretty well-marked paresis. The tropometer in such cases gives misleading indications. But with the screen-test the two eyes, even

though the fixation is alternate, are acting binocularly and each under similar conditions, and if there is any difference between the two it will be shown by a difference between the primary and secondary deviations. Hence the test thus made affords more reliable information than that furnished by any merely monocular test.

A word may be added in comment on cases II and III. These were undoubted instances of *congenital deviation*. According to Kunn (as cited by Willbrand and Saenger, *Neurologie des Auges*, I, p. 93 and by others), secondary deviation of the sound eye does not occur in congenital paralysis. The inaccuracy of this dictum I have verified over and over again. In fact not only is a secondary deviation after present in the sound eye in cases of congenital paralysis, but it behaves just like the secondary deviation in acquired paralysis.

This is well seen in the case of the not infrequent congenital paralysis of the superior rectus. Here if the paretic eye fixes, the sound eye will deviate obliquely up whenever adducted. This oblique deviation is due to a secondary spasm of the inferior oblique (the associate in the sound eye of the paretic muscle in the other).

A deviation of this sort was well shown in the following case:

CASE VI.—*Congenital Paresis of Superior Recti (especially in right eye); Secondary Deviation of Left Eye (under guise of Spasm of Inferior Oblique).*—Royal B., aged 10. It has been noticed ever since birth that the left eye deviated up. His mother's father had the same affection.

With red glass shows in primary position vertical (left)* diplopia of 10° which increases fast as he looks up and to the right, and is also present although in diminishing amount in the lower right hand field. In binocular vision when he looks to the right, left eye shoots obliquely up. This much more marked when the eyes are elevated somewhat above the horizontal plane. Movement of right eye up and to the right is restricted, down and to the right is excessive. Movement of left eye up and to the left is restricted. Maddox-rod clinometer shows in right eye little or no torsion, in left

*I. e., diplopia with the image of the left eye below.

a negative torsion* increasing 15° when the eye is elevated to 10° .

After tenotomy of right inferior rectus which produced a moderate over-correction, the negative torsion of the left eye was transformed into a positive torsion of 5° (i. e., the vertical meridian was tilted to the right). When the eyes are carried to the right, even when above the horizontal plane, the left eye moves properly, *no longer flying up as before the operation*. Single vision when the eyes are directed up and right; right diplopia (i. e., vertical diplopia with image of right eye below) in looking down and right and up and left.

As the diplopia in the lower field interfered with binocular vision in reading, an advancement of the right inferior rectus was made. The ultimate result was single vision in the entire lower field, right hyperphoria 1° in the primary position. *Now when he looks to the right, the left eye shoots up* as it did at first (but not so markedly) and in the right upper field there is again vertical (left) diplopia increasing when the eyes are directed far up and to the right to 18° .

Here it might have been argued that the oblique movement of the left eye, when the eyes were directed to the right, was due to a faulty insertion of the internus or of some other muscle. That such was not the case, and that in fact it was due to a secondary deviation of the left eye, appearing under the guise of a spasm of the inferior oblique is proved by the following facts:

1. The oblique up-shoot in the left eye was relieved and so also was the left-hand torsion of the eye by an operation performed on the right inferior rectus. This operation obviously could not have affected attachments or insertions in the left. What it did do was to allow the right eye to rise and move freely in the upper right-hand field where before it had moved with difficulty owing to a paresis of the superior rectus. In spite of this paresis of the right superior rectus the right eye had been used for fixation, and, as always happens in such cases, the fellow eye showed a marked secondary deviation, presenting itself under the aspect of a spasm of the associate to the paralyzed muscle, i. e., a spasm of the left inferior oblique. This had caused not only the

*I. e., vertical meridian of left eye is rotated to left.

up-shoot of the left eye when adducted, but also the outward (left) torsion. When the paresis that caused this secondary deviation was relieved by the operation, the secondary deviation itself and with it the tension to which it gave rise disappeared.

2. When the original condition was partially restored (by the advancement of the tenotomized muscle), the up-shoot of the left eye also returned in part.

No clearer proof could be had that the oblique movement of the left eye in this case was due, not to structural conditions in that eye, but to excessive innervation; and the case also furnishes excellent evidence not only that a secondary deviation exists in congenital paralysis, but that it altogether resembles in behavior the secondary deviation occurring in any other form of paralysis.

INJURIES OF THE IRIS, WITH REPORT OF A CASE OF IRIDODIALYSIS IN WHICH THERE WAS A COMPLETE REATTACHMENT OF THE IRIS.

By

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Injuries of the iris *per se* are generally limited to two; i. e., radiating lacerations of its structure, and a tearing of the iris from the ciliary attachment (iridodialysis). They may, and in fact generally do, occur together, the lacerations varying from good sized rents, which are plainly visible at the pupillary margin, to ones of microscopic size occurring throughout the iris tissue.

Radiating lacerations which start from the pupil may extend to the ciliary margin, so that the pupil at the site of laceration appears to be prolonged in the form of a pointed Gothic arch to the margin of the cornea. Such large lacerations, however, are rare. Generally the pupillary margin is simply torn into a little way and the laceration gapes so slightly that it is discovered only upon careful examination with the aid of a magnifying glass. Such small lacerations are the most frequent cause of dilatation of the pupil, which develops after contusion and which is formed upon the weakening or paralysis of the sphincter due to laceration. This iridoplegia may disappear entirely in favorable cases, but in others a moderate dilatation of the pupil remains permanently. The ciliary muscle, too, may be paralyzed by a contusion as manifested by the diminution of the amplitude of accommodation.

In iridodialysis, as previously stated, we have the iris torn from the attachment to the ciliary body. It may occur to any extent, from a scarcely perceptible tear to a complete separation. In a partial detachment we find on one side, at the ciliary margin of the iris, a black crescent, which is

formed by the separation of the iris from its insertion at the spot, so that the examiner can look into the interior of the eye. When the separation is pretty considerable the edge of the lens, the ciliary processes, and the fibers of the zonula of Zinn stretching between the two, can be recognized by means of lateral illumination in the gap that is thus produced.

The pupil has lost its round form, owing to the fact that the pupillary margin toward the side of the iridodialysis has shortened so as to occupy the chord of an arc instead of the arc itself. The cause of this inward displacement of the pupillary margin lies in the fact that the separated portion of the iris is stretched in a straight line by the contraction of the sphincter. The sight is but little affected by iridodialysis; the only unpleasant feature being that, if the eye is not accurately focused, monocular diplopia may occur, due to the formation upon the retina of an image both by means of the pupil and also by way of the peripheral opening.

The more rare conditions resulting from injuries of the iris are a complete absence of the iris (aniridia traumatica) a bending backward of it (introversion of the iris [Ammon]), and a bending forward (anteversion). In the first case the iris becomes folded up into a ball which sinks to the bottom of the chamber, and which by the next day has shrunk into a little inconspicuous gray mass. If a rupture of the sclera has been at the same time produced by the injury, the separated iris may be expelled altogether from the eye through the scleral wound. De Beck reports two cases of traumatic irideremia. Both cases: sustained blows producing rupture of the cornea and extrusion of the iris without injury to the lens. In introversion the iris is bent backward in such a way that it lies upon the surface of the ciliary body. The iris is then invisible in its ordinary position, just as if it were wanting there. Total introversion of the iris is very rare. Partial bending backward of the iris is more frequently observed, especially in scleral rupture at the place corresponding to the rupture. Here the iris seems to be wanting, and a coloboma appears to exist just as if an iridectomy had been made. In rupture of the sclera, however, a piece may be torn out of the iris, so that a true coloboma traumaticum is formed. In anteversion the detached por-

tion of the iris is turned upon itself so that the under or uveal surface is exposed.

Penetrating wounds of the iris are complicated by wounds of the cornea, and usually with injury of the lens and ciliary body, and are generally accompanied by a prolapse of the iris. If the ciliary body be injured, the conjunctiva, the sclera, chorioid, retina and vitreous, as well as the iris are usually affected. If the penetrating body be clean, infection does not take place, there is usually but little bleeding, and healing results, with damage dependent upon the extent of the injury. If a wound of the iris be accompanied by infection inflammation results, which may extend to the ciliary body and chorioid, with resultant iritis and iridochorioiditis. Sympathetic ophthalmitis may arise from infected iris-injuries, but is usually due to those of the ciliary region.

Injuries of the iris are generally accompanied by hemorrhage into the anterior chamber. The blood which arises from the ruptured vessels of the iris sinks rapidly to the bottom of the chamber (hyphemia) and for the most part disappears by resorption within a few days. Then, and seldom before, we are able to investigate completely the damage which the iris has suffered from the injury, and we find perhaps, an iridodialysis or radiating laceration. But often even then it is impossible to discover a solution of continuity in the iris, and so the source of the bleeding remains unknown. In many of the cases the blood is supposed to come from a laceration of Schlemm's canal (Czermak).

Foreign bodies in the iris are comparatively rare. A body striking the eye with such force as to penetrate the cornea or sclera usually retains enough impetus to pierce the delicate tissues of the iris. Chips of metal or stone are the bodies that are most frequently found. Small bits of stone or steel may remain in the iris for many years without producing inflammatory reaction. Copper is much more dangerous, even when bacteriologically clean, as it gives rise to severe irritation by its chemical reaction.

The detection of a foreign body in the iris is rarely difficult, although in a fresh case the presence of blood in the anterior chamber and haziness of the cornea from coincident traumatic keratitis may obscure the field. In case the foreign body has carried germs of septic infection with it into the eye,

severe inflammation almost invariably results, as the vascular iris offers a particularly good soil for the propagation and transportation of infectious material.

The following case occurring in the author's practice is interesting because the iridodialysis, which was produced was healed, a result which is seldom obtained, except in very minute tears.

Oct, 9th, 1903, G. D. aged 23 years, was accidentally struck in the left eye with a piece of sign board by a companion. I was called soon after the accident and on examining the eye found the following: The external canthus had been divided in a jagged manner, and the lower lid was badly bruised at one point. An examination of the eyeball showed that an extensive iridodialysis had been produced. The iris being torn from its point of attachment for at least 4 mm. The tear was situated at the upper and outer periphery of the iris. The pupil was egg-shaped, the apex being drawn downward and inward to a point at the sclero-corneal junction where there appeared to be a perforation. The next morning the nurse reported that the patient had passed a rather restless night. An examination with better illumination showed conditions to be about the same, only that there was no perforation of the eyeball at the point suspected. The iridodialysis still existed. There was some vision, the patient being able to see large objects about the room. Commenced the use of atropin and advised complete rest, but as is usual in this class of cases I could not keep the patient quiet. He lived in a neighboring town, and insisted on going home and coming back the next day. This necessitated a railroad journey of about eighteen miles. Patient reported next day that he had passed a comfortable night. On examining the eye I found that an extensive hemorrhage had taken place into the anterior chamber. Vision was nil and T was plus 1. The hyphemia did not apparently affect the final outcome, but made the recovery more tedious. After the blood had been absorbed it was found that the iridodialysis had disappeared. An ophthalmoscopic examination revealed a rupture of the chorioid at the temporal side, and slightly above the optic papilla. It was about 8 mm. in length, slightly concave with the convexity directed toward the nerve-head. At the present time $V = 20/200$. There is a permanent mydriasis, but the iridodialysis has

completely disappeared. No atropin has been used since the 10th of November.

Speaking of a cure in these cases, a review of ophthalmological literature shows very few cases reported, some authorities even going so far as to say that reunion of the detached iris to the ciliary body is impossible. Norris and Oliver in their *System of Diseases of the Eye* say: "Iridodialysis is generally a permanent lesion. Occasionally a reattachment of the iris to the ciliary body occurs."

Berry mentions such a favorable result from the records of the Dublin Eye Hospital and Gruening, of New York, reports one case occurring in his practice where there was a reattachment. The separation was a small one located in the upper periphery of the iris and was complicated with hyphemia. De Schweinitz, "*Diseases of the Eye*," says: "In a few instances reattachment of the ruptured fibers has taken place under the favorable influence of atropin. Ordinarily the lesion is permanent." Fuchs, "*Text Book of Ophthalmology*," states that "in the majority of cases owing to the contraction of the sphincter muscle of the iris union of the latter to the ciliary body is impossible."

Swanzy, "*Diseases of the Eye*," says: "Restoration to the normal state in these cases rarely takes place. I have observed one case in which the iridodialysis, a very minute one, was healed and there is one other such case recorded.

PSEUDO-NEUROEPITHELIOMA OF THE RETINA
WITH INCREASED INTRAOCULAR TENSION.
REPORT OF A CASE.

BY JAMES MOORES BALL, M. D.,

SAINT LOUIS.

Cases of pseudo-neuroepithelioma of the retina, presenting increased intraocular tension, are of such unusual occurrence, that the writer feels justified in submitting this clinical report.

H. S., male, aged five years, was referred to me April 15, 1897, by Dr. Roland Hill of St. Louis. One year before this date the parents noticed that the pupil of the right eye presented a grayish appearance. No one was consulted about the case at that time. The father thinks that when the abnormal appearance was first noticed the boy could see with the affected eye, but he may have been mistaken about this. The child has had no pain. There is no history of trauma.

On examination I found a strong, healthy looking boy. The right pupil was dilated and presented a grayish white color. The iris responded to light. The tension of the eye was normal. Homatropine was used to further enlarge the pupil and an ophthalmoscopic examination was made. This showed the presence of a mass which was centrally located behind the lens; and was apparently situated in the anterior part of the vitreous humor. There were no vessels on the growth. The reflex from the mass was of a whitish or light gray color, without a trace of yellow, such as is seen frequently in true neuroepithelioma of the retina. There was no redness about the eye. Vision was entirely lost.

The patient was kept under observation —On July 17 the anterior chamber was almost obliterated and *the intraocular tension was increased (plus 1)*. This state of affairs persisted. On July 26 I made an enucleation. Not being sure of the nature of the growth, I removed only the eyeball, and 6 mm. of the optic nerve. If I had been certain of finding

a true neuroepithelioma I should have made a more radical operation (exenteration).

The eye was hardened in formol and sections were stained with Van Gieson-Ernst solution. The specimen shows a complete detachment of the retina due to the contraction of new connective tissue as a result of inflammatory action.

The patient was under observation two years later without any sign of disease.

Elsewhere* I have discussed the diagnosis of neuroepithelioma of the retina.

*Ball: Modern Ophthalmology, p. 484, Philadelphia, 1904.

THE RECEPTION OF MEDICAL DISCOVERIES.

BY GEORGE M. GOULD, M. D.,

PHILADELPHIA.

Readers of history are repeatedly struck with the fact that discoveries and new truths which, if accepted and acted upon, would have made for progress and the good of the world, would have saved numberless lives and inestimable suffering, have been at first rejected; and by the very leaders and judges whose function and duty it was to judge wisely of such things! Instead of discriminating these have almost always shown an utter lack of discrimination, and have condemned the truth to death and its discoverer to silence. After many years the dead discovery is disinterred, and, as it was only a case of suspended animation, it is brought to life and welcomed to a beneficent activity. But probably the discoverer himself was really dead, often of the contumely heaped upon him. The new truth finally accepted, again becomes old dogmatism in the minds of late and belated receivers, and in their turn these resume the old work of rejecting with scorn the new truths which may be discovered in their time. And thus the combination of farce and tragedy is repeated by every generation with every discovery. One of the reasons for its pathetic recurrence is that the perpetrators are ignorant both of psychology and history, and therefore have no suspicion that they are recommitting the same old blunders of their forefathers. Religious history is full of capital illustrations of this law, admirably epitomized by White in his *Warfare Between Science and Theology*. The history of metaphysics and philosophy offers as striking and as numerous demonstrations of the truth. In Science I may cite a few of the many illustrations occurring in recent times:

Galvani, the professor of physics in the University of Bologna, discovered galvanism, as we now term it, and afterward wrote: "I am attacked by two opposite parties—the

learned and the ignorant. Both laugh at me and call me the frog's dancing master. But yet I know that I have discovered one of the forces of nature."

The great chemist Lavoisier demonstrated to the Academy that meteorites *could not* fall from the skies, and would not believe, even when he had touched and examined an aerolite.

The possibility of fossil man was denied by the great scientific authorities, Cuvier, the master, pitching the bones out of the window in disgust, and burying the discovery in ridicule for thirty years.

In 1776 Jouffroy invented steamboats, and ruined himself financially in demonstrating the feasibility of his invention. The French Academy of Sciences reported unfavorably, and the inventor was thoroughly lampooned. Fulton, in 1804, was no more successful with the English government, and only succeeded in the United States in 1807. Lardner's famous essay showing the impossibility of the steamship was brought over on its first trip.

Lebon, a Frenchman, discovered how to use gas for illuminating purposes in 1797; he died in 1804 without seeing his invention accepted, and it was only in 1818 that the Parisians would believe in "a lamp without a wick." The English adopted the invention in 1804 in Birmingham, and in 1813 in London.

Franklin's paper on lightning-conductors was laughed at by the Royal Society, which would not publish it in the *Transactions*.

Ohm was treated as a madman by his fellow Germans. The Dutch senators refused the inventor a patent on glasses because they were only adapted to one eye.

A committee of the most eminent engineers of England opposed the use of locomotives on the first complete railroad. Arago in the Paris Chamber of Deputies exposed the fallacy and the folly of those who would use locomotive engines on railroads, and the Bavarian Royal College of Doctors declared that if railroads were constructed the health of the public would be ruined, as the rapid movement of the train would cause brain trouble, vertigo, etc., in the travellers. It recommended that if used the tracks should be enclosed by high board fences, raised above the level of the cars and engines.

In 1855, when the submarine cable was advocated, a great

authority in physics, Babinet, a member of the Institute, and an examiner in the polytechnic school, demonstrated the impossibility of the plan in the *Revue des deux Mondes*. Our own Professor Lovering, of Harvard College (afterward President of the American Association for the Advancement of Science), when Field was preparing to lay the first Atlantic cable, demonstrated to his classes the utter impossibility of telegraphing under an ocean 3000 miles wide.

The opposition DaGuerre had in discovering photography is well known. He was put in an asylum because he said he could transfer his likeness to a tin plate.

The abuse heaped on Newton for substituting blind gravitation for an intelligent Deity is another instance.

A practicing physician, Young, as early as 1801, hit upon the true theory of the luminiferous ether, and of light and color, which nearly a century before had been discovered by Robert Hooke. But his scientific contemporaries would not see it, and to avoid persecution and deprivation of practice, Dr. Young was compelled to publish his grand discoveries and papers anonymously. Published finally by the Royal Society (one can imagine the editor's smile of superior wisdom over such trash), they were as utterly ignored as were those of Mitchell, Thomson, and Martin, as to eyestrain two or three generations later. Arago finally championed Dr. Young's theory in the French Academy, but the leaders, LaPlace, Poisson, Biot, etc., denounced and conquered, and not until 1823 would the Academy allow the publication of Fresnel's papers on the subject; in about 25 years the silencers were themselves silenced. But Young had been silenced too, his disgust so great that he resigned from the Royal Society, devoted himself to his poor medical practice, and to deciphering Egyptian hieroglyphics.

The all-comprehending generalization of the conservation of energy has an equally sorry history. In 1806 Davy first, in a way, introduced the thought and Faraday in 1831 and 1840 developed it a little more explicitly; in 1842 Carnot caught the truth. A German, Mohr, in 1837, uttered it most clearly, and although his article was published in the official magazine, it was ignored by his countrymen. Another physician, Mayer, in 1842, noticed that a tropical patient's venous blood was redder than was usual in temperate climates. He followed up the question, *why?* and

this time bloodletting resulted in good, and unknown to the world, Dr. Mayer independently thought out the true doctrine of the sun's persistent light and heat. The world did not hear; the contumely he met caused Mayer, it is said, to throw himself out of a window. In the fifties a Manchester manufacturer read a paper before the British Association, and no one heeded it in the least. Two years later he tried to read another, but the Chairman would permit only a brief verbal synopsis. The leaders were again not leading, and even Faraday, Brewster, and Herschel could not accept, and all the official judges of the world were silent. Whewell in his *History of the Inductive Sciences* does not mention the theory of Mayer and Joule. It was only rising, young and unknown men that finally brought the work and its value to recognition. It is, indeed, usually the young ones that made, and that still make the discoveries. Davy, Young, Fresnel, Arago, Forbes, Joule, Mayer, Helmholtz, Sir Wm. Thomson, Clausius, Rankine, and others, were in their twenties when they made their greatest discoveries.

The whole thinking world, says Williams, repudiated Lamarck's epoch-making philosophy of the transformation of species, as it had done with that of Erasmus Darwin—repudiated with acclaim. The official judges, and especially the great Cuvier, denied and opposed, and Lamarck died in 1829 without seeing any recognition of his truth; it lay dead for a generation. "Heresy" and "impious visionary" were the verdicts of theology and of science. "The whole conservative majority of mankind recoiled with horror," is also the statement of the historian concerning Darwin's contribution.

In 1865 an Austrian monk published the report of some experiments in heredity. No scientist looked at his article or saw its purport for 35 years, although his paper was sent to all scientific journals and societies. Mendel's law is now acknowledged to be one of the most profound and illuminating in modern developmental science, and his name will go down to posterity with those of Darwin and Lamarck. Darwin, prevented by his eyes from knowing well the world's scientific literature, published his *Animals and Plants* in 1868, without having seen Mendel's article.

In medicine it is particularly unfortunate to reject offered truth and discovery, because medicine is at heart both science and philanthropy, and the nonacceptance means at once lack

of knowledge, and the nonrelief of patients at the instant under the care of the skeptic. Rejection of a medical truth becomes immediately condemnation of the patients to death or to a continuance of their suffering. The history of the discovery, the reception, and the rejection, of vaccination is a perennial illustration.

Inoculation of cowpox as a protection against smallpox was known by many nations in past ages. Humboldt says it was understood and practiced by Mexican shepherds. The dairy folk of Europe knew of it, and especially those of England, long before the brave Dorsetshire farmer, Benjamin Jesty, inoculated his wife and two children from the teats of the cows. The experiment was successful, but not even Jenner dared to repeat it on the Phipps boy until 22 years had passed. It was still a long time before the profession and the world accepted the measure, and the opposition was so great that it was passed down to the ignorant of our own time. Only Germany and Japan have become civilized enough to accept it fully, and they have no smallpox. The rest of the world is still paying the penalty for its sad disbelief. For instance, in 1885, during nine months, 3,164 Canadians died from neglect of vaccination, and all the patients caught it from one case of the disease imported from Chicago. The extent of the antivaccination movement today among the ignorant is an indication of the bitterness and length of the struggle of the supposedly enlightened. For the law of heredity applies to medical prejudice and superstition. The longer in forming, the more enduring is the "cake of custom." Hence, Mrs. Eddyism and medical magic generally are powerful, and will long remain.

In 1760 Auenbrugger had discovered the principle of thoracic percussion and published a book making it known to the world. He wrote in his preface to this work:

"My discoveries in this subject are not committed to paper because of an itch for writing, nor an inordinate desire for theorizing. Seven years of observation have put the subject in order and have clarified it for myself and now I feel that it should be published.

I foresee very well that I shall encounter no little opposition to my views and I put my invention before the public with that anticipation. I realize, however, that envy and blame and even hatred and calumny have never failed to

come to men who have illuminated art or science by their discoveries or have added to their perfection. I expect to have to submit to this danger myself, but I think that no one will be able to call any of my observations to account. I have written only what I have myself learned by personal observation over and over again, and what my senses have taught me during long hours of work and toil. I have never permitted myself to add or subtract anything from my observations because of the seductions of preconceived theory."

In 1774 Van Swieten, a distinguished writer on medicine, published a learned work on medicine, and in 1779 appeared De Haen's 18-volume System of Medicine; neither had heard anything of Auenbrugger or of percussion. In France Corvisart practiced percussion 15 years without convincing his colleagues of its value. Auenbrugger's book had been published in 1770, but not till 1808 did French physicians accept the device. Napoleon made Corvisart his personal physician, because attracted by his progressiveness illustrated in practicing percussion. His other physicians had told Napoleon that his trouble was *gale répercutée*, i. e., itch struck in. That was the official science of the day, which Hahnemann "potentized" and consecrated. The peasant women of Poland knew more about the itch than Hahnemann and all the medical men of Europe. The poor girls had found out that the *acarus scabiei* could be dislodged from beneath their skin with their sewing needles. When the unscientific Parisians heard of this procedure there was an end forever of the scientific *gale répercutée*.

In Boston a dentist, Dr. Morton, had demonstrated that a surgical operation could be performed, the patient being unconscious from administration of sulphuric ether. Before this the surgeons of Europe had despaired of such a discovery, and while the news of Morton's discovery was on its way to Europe, the leader of English Surgeons, Sir Benjamin Brodie, said anesthesia was impossible. Following Morton's discovery there was incredulity and outcry; the shock of pain was beneficial to the patient, said some surgeons; the pulpit said pain was God-given, etc. Morton had great difficulty in getting the profession to recognize the value of the discovery, and when this had been effected, disgraceful attempts were made to rob him of the honor. Sir James Y. Simpson only conquered the prejudice against the use of

chloroform in child birth, by quoting the biblical story of the Lord throwing Adam into a deep sleep before Eve's birth.

Every student of the history of medicine knows of the fight made against the theory of microorganisms as the cause of fermentation and of certain diseases. In 1762, Pleincz, of Vienna, a scientific mind, had stated that the phenomena of disease and of decomposition of animal fluids were wholly caused by these minute organisms. Later the great authority, Liebig, withstood the doctrine so persistently and successfully that for 25 years, until Pasteur came, the "vitalistic theory" was compelled to keep silent; and even when Devaine showed that anthrax was due to one variety, the world would not be convinced, until in 1876 Pasteur ended the bitter controversy by the famous anthrax test on 60 animals, in which the 30 that had been protected lived, and the 30 that had not been protected died.

The two greatest authorities on the subject signed the adverse report against Dr. John Snow's findings as to the pollution of the famous Broad Street well, thus postponing the knowledge of the true nature of water-borne diseases.

How bitterly for about 20 years the discovery of Pasteur and Lister was fought and scorned by physicians is well known. For 10 and even 20 years after the demonstration, hospital gangrene killed as of old. The surgeon, Chassaignac, warned Pasteur that "laboratory results should be brought out in a circumspect, modest, and reserved manner, etc."

We are still living in the end of the professional struggle against Behring's antitoxin serum for diphtheria. Others are to come.

When the great brave McDowell published his work in 1809, all who knew of it condemned it. It was 40 or 50 years before it was at all appreciated, and even then Atlee and the followers of Tait met with bitter opposition before ovariotomy was recognized as a justifiable procedure.

In his great essay our own O. W. Holmes in 1843 showed himself the true John the Baptist of antiseptic, because he contended, long before the germ theory of disease was recognized, that puerperal fever was a contagious affection. Of course he met with the bitterest opposition from all the leaders of the profession, Hodge, Meigs, etc. In Vienna two years later, not knowing of Holmes' book, Semmelweis tried to convince his fellow practitioners of the same self-evident

fact. He taught the use of a chlorine solution as a disinfectant. The violence of the hatred aroused in the hearts of his professional brethren was so great, that Semmelweiss was driven from his professorate and ruined professionally and financially. Even in 1856, in the Paris Maternité, 64 women died out of 347 admitted, and in 1864, 310 out of 1350. At last, in 1874, Fournier and Budin succeeded in introducing the new views of Pasteur and Lister in spite of what Dr. Roux calls "the tyranny of medical education," and puerperal fever forever disappeared.

The autobiography of J. Marion Sims gives another chapter of this world-wide stupid malevolence, or malevolent stupidity. His struggle against the fierce opposition of those whose office it was to know science and to do right was most pathetic. He nearly starved to death during many years in which his professional colleagues utterly ignored him; then their hatred and opposition gave him some encouragement, until finally the denouncers themselves became silent, or "always recognized the real value of the truths advocated."

In the closing years of the eighteenth century Tuke in England, Pinel in France, and Rush in America, contended that chaining maniacs with riveted iron bands, in dungeons, often in darkness, and always in filth, was neither medicine nor humanity. It took a life-time to effect partly their reform, and even today it is not entirely completed.

The French Academy ridiculed the discovery of Desmoulins as to senile atrophy of the brain, and forbade the iconoclast the privilege of further hearings.

Bell's great discovery as to the functions of the anterior and posterior roots of the spinal nerves, made in 1811, was ignored by the court of final appeal in Paris, and not until 1823 was it in part accepted.

"The fundamental law of psychophysics," formulated by Weber, was ignored and denounced for over 20 years by his scientific associates, until Fechner made them listen.

In 1825, Dr. Boillard had located the speech-center in the brain, but despite his pertinacity the world would not listen, and the cerebral localization of function waited until about 50 years later it was in great part threshed out, though even great Masters, as Goltz, still denied within the last generation.

It is doubtful if there is a single important discovery in

all the history of medicine which was not at first either ignored, or opposed. If a man is himself an authority and power, the ignoring and hatred of him will find vent in both ways. If he can be snuffed out by silence alone, that is the plan pursued. What a combination of thick-witted blundering and malignity!

For, what at last has the light-bringer to gain by his temerity? What crime against religion and the simple law of kindness, to treat him and his announcement, even if not true, with anything but a careful hearing and respectful testing! These few men with minds capable of discovering and benefiting mankind are the most precious products of the groaning and travailing ages. They are the prerequisites of progress, martyrs, sufficiently, of their own sensitiveness and unselfishness, without the added and heaped sorrow of cold neglect, of colder disdain, and of an immeasurably inhuman cruelty. Men will help raise a monument to one of their martyrs, go home with their throats still hoarse from praising and hurraing, and at once resume the making of new martyrs, as their grandfathers did of the dead one of the monument! As Pope said: "They help to bury whom they helped to starve."

The principal methods of killing new truth, as shown in historical examples are, therefor, these:

1. By silence and ignoring.
2. By opposition on supposed scientific grounds.
3. By opposition and denial *per se*, without giving reasons.
4. By ridicule and sneers, also without reasons.
5. By the cry of exaggeration and hobby-riding, without explanation or instance.
6. By pointing out real or partial errors and exaggerations, emphasizing them, and saying nothing as to the truth admitted or not admitted.
7. By saying that the theory is old, long admitted, or long ago refuted.
8. By "insinuendos" that the author is advertising himself from the motives of vanity or the desire for practice, etc., that he has, as Dr. Sachs charges, "private axes to grind."

All of these methods of preventing the acceptance of discoveries, and their practical applications are psychologically

devices of the baulking mind to obviate troublesome changes in mental attitude, undesired activity in new ways, etc., and in reality are motivated upon one or another, or several of the following combined conditions:

1. Mental laziness. The ordinary mind, (and therefore the pseudoscientific one) desires certainty, settledness of habit, rest in the known, ease in the Zion of the acquired and satisfying. New thought and new truth is an affliction, a spur to new activities, and change of life.

2. Wounded vanity. "I did not make this discovery or think of it," one seems to hear, "and every method (in practicing medicine, e.g.) of future action must be changed, and the confession thus made every day that I was before in the wrong, and that my knowledge was error. It is too humiliating!"

3. Prejudice. A position once taken, an opinion once accepted, a party once publicly espoused, gives a seeming warrant for continuance of the old and trusted belief.

4. The authority of leaders. "The great authority so and so," one hears again, "is unconvinced, and he knows better than I, or the upstart, and I will wait until he changes his opinion," the motive being cunning safety.

5. Influence of societies. The greater the power and attendance of governing and authoritative societies the more certain are they to oppose new truth and discovery. The old leaders never lead. The crowd-instinct tends to sweep its members to a unity of indulgence in tradition and the sacredness of the truth heretofore established. For the same reason the official journals of powerful or large medical societies are always likely to be on the wrong side as to medical discoveries.

6. True and confessed ignorance, and inability to decide. The vast mass of men, or a class of men, must be incapable of deciding upon a matter about which they have no first hand knowledge, and for which special as well as general culture is demanded. Some, or indeed many of these must recognize this fact concerning themselves, and thus wisely wait for the tide of opinion to change.

7. The financial cost. This is an increasingly dominant motive. In making the greatest discoveries of modern times a poor practicing physician, Dr. Young, had to publish his articles anonymously because of the danger to his practice

from being scientific. The historian records that patients demand of their doctor "sophistry rather than philosophy." Nothing blights a modern young practitioner's reputation quicker, prevents his "success" more assuredly, kills his hopes of professorships, and offices, and hospital positions, speedier, than so-called "exaggeration" and "hobby-riding." Add to this that those who already have private sanitariums and consultation practices to sustain, must be extremely wary in avoiding the calumny that comes from "extremism." Lastly, many medical journals are purely commercial undertakings, and have the publishers' profit always in mind, or the editor's interest in some patent or secret nostrum, or institution. The editorial position and salary are powerful arguments.

8. True and genuine conservatism, both good and bad. It is indeed well to get out of the old truth all its good, before renouncing it. Many too hastily accepted theories and discoveries have proved to be will-o-the-wisps leading to bogs and disappointments. As to this, however, the obvious answer is that it proves at best a lack of discriminating ability on the part of the too lenient acceptors; and finally their condemnation is complete in the fact that testing is the needed thing both of the new false and of the new true proposition. False conservatism is that which does not test, either in its acceptances or in its rejections, and true conservatism is that which neither denying nor assenting, tests and weighs.

Turning from general scientific and past medical illustrations of the opposition to new truths, it may be more illuminative to give one striking instance which is taking place in our own time. The data are at hand, which is not always so, at least specifically, of others; and to catch our contemporaries and colleagues, our very acquaintances, *in flagrante delicto*, is more instructive than when we read only of those who are dead and gone.

The first word, so far as I am aware, publicly uttered, which announced that ametropia had pathologic or morbid systemic consequences was that of the Dean of the American ophthalmologic profession, Dr. John Green, of St. Louis. In 1867* he had concluded that astigmatism was an

*Arch. Ophthal. and Otol., 1869, I, No. 1, pp. 17-21.

active cause of myopia. Soon after 1861 Dyer, of Philadelphia, had begun to prescribe astigmatic lenses, but there is nothing, so far as I can learn, to show that he had any belief or proof that ametropia caused ocular or systemic disease. This honor, therefore, belongs to Dr. Green, so far as the relation to the eye is concerned. To Thomson, of Philadelphia, and secondarily to Norris, of Philadelphia, belongs the equal, and in its consequences, greater honor of suggesting that the evil effects of eyestrain extended also to the brain and nervous system, and thence to the functions of other systemic organs. In conscientiously and ingeniously correcting the astigmatism, etc., of his patients, Dr. Thomson found that they came back and reported relief of headache and other distressing symptoms and with the discerning eye of the true clinician he noted, retested, and reproved the reports. This was just prior to 1874. Dr. Thomson spoke to Dr. S. Weir Mitchell, a neurologist of Philadelphia, of his new findings, and Mitchell at once seconded them and published three articles* concerning Dr. Thomson's cases, in which it was shown that headaches, insomnia, vertigo, nausea, and failure in general health were consequences of refractive and accommodative anomalies of the eyes. Two of the cases reported in these articles of Mitchell were of patients of Dr. Norris. The facts were discovered by Thomson and Norris; Mitchell, adding nothing original, simply made them public. Dr. Thomson followed up his early observations and in 1879 published a noteworthy and confirmatory article† on "Astigmatism as a cause for persistent headache and other nervous symptoms."

In the first case, to ametropia was ascribed "some forms of chorioidal disease, fatigue and pain in the eyes, congestion, inflammation of the lids and conjunctiva, nutritional changes in the fundus, neuralgic pains over the frontal region, throughout the head, and even vertigo and nausea." These were entirely cured by glasses.

In the second case reported, supposed "disease of the brain and spinal cord" had been treated, for many years, by distinguished men in the chief American and European cities. The least use of this patient's eyes produced a long list of

**Medical and Surgical Reporter*, July 25, 1874, and August 1. *Ibid.*, Feb. 6, 1875, and *Am. Jour. Med. Sci.*, April, 1876.

†*Med. News and Library*, June, 1879.

mental and neurologic symptoms, ending in "a fit of some kind," and recovery was by renouncing his pen, walking in the open air, etc. Immediate and complete relief for nine years followed the use of Dr. Thomson's lenses. Then presbyopia was at hand, and Dr. Thomson prescribed for the complication, but the Parisian optician who filled the prescription thought he knew better and gave the patient the wrong glasses. All of the old symptoms returned, until correct lenses were ordered and the symptoms disappeared.

The third case was that of a naval officer with pain at the base of the brain, tinnitus, mental restlessness, inability to do mental work, pain over the left brow, extending to the occiput, severe tension of the head, failure of mental vigor, etc. He resigned, lived in open air a year, thought himself recovered, and returned to work, with immediate resumption of all the old symptoms.

"Cerebral congestion" was now diagnosticated by a great authority in the diseases of the nervous system. [They are still making the same diagnosis, sometimes calling it "psychosis," or "neurasthenia," etc.] Life in the open air was again ordered. "Migraine" developed, "nervous headaches," scotoma scintillans, hemicrania, hemianopsia and nausea. Proper glasses ordered by Thomson gave almost complete relief.

The fourth case was one of sick headache on near use of the eyes. Spherical glasses alone gave no relief, but cylinders did so. A sudden recurrence of the old severe symptoms resulted in the discovery of a blunder, which is still frequently being made: An optician [probably an "eyes-examined free" man, or "a refracting optician"] had repaired the accidentally broken frames and reversed the lenses so that the woman "had now two astigmatic eyes instead of one." Almost entire relief followed Dr. Thomson's correction.

The fifth case reported by Dr. Thomson was of a school girl who had been obliged to quit school because of severe pain in the back of the eye, twitching of muscles, etc. Mother and grandmother had been sufferers from neuralgic headache, and ill-health. All three were found to be astigmatic and all were cured by Dr. Thomson's glasses.

I have epitomized these admirably reported cases, because, together with those summarized in *Biographic Clinics*, Vol. I, they form the earliest demonstration of what has

been taking place in every competent oculist's office, every day since.

But, note well, these reports and others that followed, were absolutely and utterly ignored by the whole world. There is not, I believe, a line in medical literature, European or American, showing that they were read, certainly none that suggests that they instigated any practitioner having patients with such diseases to try the experiment of accurate correction of ametropia. How many thousands, should one not say millions, have gone on suffering as before, with these symptoms, treated as cases of "brain congestion," "brain disease," "dyspepsia," "neurasthenia," "hysteria," "gastric disease," "psychosis," and all the rest? Hundreds of testimonies have since been added by intelligent and honorable physicians, and thousands of such cases have been reported; and yet there are great physicians, neurologists, "distinguished authorities," psychiatrists, and diagnosticians, who are as silent as they have been on this subject for 25 years, or who break that silence only to ridicule and scoff. Today in every oculists' office there appear patients who for years, few or many, or for a life time, have vainly sought relief from one after another of these authorities, of just such sufferings. And today they are cured by the careful oculist just as quickly and permanently as they were by Dr. Thomson. Today if an "optician" misplaces a lens of their spectacles they have the same recurrence of symptoms which Dr. Thomson's patient had. There are great and famous neurologists who have contempt and loathing for the mere suggestion of a morbid reflex, although their epiglottis unconsciously and reflexly saves them from suffocation by its reflex action with every swallow taken; although every motion and function of the body is reflex; and although pathology is only morbid physiology. It is, indeed, pertinent to inquire as to the reasons for and methods of this amazing fact.

When an author issues a scholastic and learned text-book, or encyclopedia upon a general subject, it is a point of pride with him to show thoroughgoing acquaintance with the literature of the subject. The most recent and the most scientific text-book on the subject of medicine is that of Allbutt. It does not contain a word about the eyestrain origin of any disease. Probably there is no European text-book

on general medicine, gastric diseases, nervous and mental diseases, which mentions eyestrain as a cause. Indeed those on ophthalmology are as indifferent to the matter, or their mention of the fact is incidental, and calculated to make the reader ignore it rather than follow it up. In our country Osler gives the subject a general and vague allusion in a sentence or two. Tyson and Anders are less generous. Anders does not allude to it in the treatment of migraine, nor does the New International Encyclopedia. The only work on general medicine of which I know that has acknowledged the ocular origin of migraine is *Essentials of Diagnosis*, Cohen & Eshner, 1892. Einhorn, Hemmeter and others on stomachal diseases make no mention of the eye as a cause.

As to "the psychoses" the opinion of the authorities is approvingly quoted by Dana in a paper read before a special meeting of the New York Academy of Medicine,* instigated to demolish the eyestrain theory. "I cannot find," he says, "any systematic writer who even refers to it."

Dana sums up his experience in saying that he has "found hardly any case in which eyestrain is an important and direct factor in establishing even a minor psychosis." Accuracy in refraction is not necessary in treatment, because "success is generally obtained without treating the eyes," and "glassing has become something of a minor psychosis." The acme of the ludicrous is, of course, added. "I heartily believe that eyestrain should be carefully looked after." Pompous ignorance and egotism coupled with a pseudoscience, which is satisfied with ticketing poorly observed facts with a high sounding name, ending with warily "throwing an anchor to windward," are all thus exemplified by Dana in an amusing way.

At the same meeting referred to, Dr. Sachs said that very few cases indeed of epilepsy, chorea, and the convulsive tics, are due to eyestrain, and cures by ocular treatment are fewer indeed. "The relation may be a close one," he says, "in the minds of some faddists, but is remote in the minds of those who have no axes to grind, etc." This is charming and highly characteristic! Dr. Sachs also incorrectly epitomized the incorrect statements of Dr. Spratling as regards the tests upon a number of epi-

*Medical News. July 30, 1904.

leptics at Craig Colony, concerning the influence of glasses. The same gloating delight at the "disappointing" results is echoed in many medical journal editorials and abstracts. The least desire to be truthful would have stated what has been published in connection with Dr. Spratling's report,* that by all the other methods of treatment pursued at Craig Colony, according to its official figures, the cures amounted to 1 in 80, while in "glassing," the cures were 1 in 57.

The reduction in the total number of seizures in three months following the test with glasses in 57 cases was 44 per cent. And yet, Dr. Sachs says, "there is no good excuse for attempting to argue with" the foolish faddist—and he is perfectly right. The repeater of false statistics does not, indeed, "argue" with any one.

At the meeting referred to at which the sentence, death, burial and chanting of the Requiescat was carried out upon poor Eyestrain, Dr. Collins said that no case of migraine had been cured, remedied, or benefited by glasses; and that was bravely done, without a single anchor cast in any direction. Heshould have quoted the saying of the great and distinguished neurologist, Professor Möbius, still living and writing, that "The tendency to headache is a part of the degeneration which is inseparable from civilization." Or, better still, he might have proceeded to the logical conclusion of Dr. Seguin and advised abandoning all medical treatment in epilepsy, and thus encouraging the recurrence of the convulsions. "Knowledge to one is a goddess, to another an excellent cow," sang Schiller long ago.

Two of the helpers drummed up for the occasion, alas, must have been sadly "disappointing" to the generals. One proved an alibi and the other proved a traitor. Both happened to be physicians as well as neurologists. Dr. Holden, in about 10,000 words concerning hysteria, neurasthenia, etc., wisely refrained from saying a word for or against the ocular origin of these diseases. Dr. Cutler actually said that "many cases of sick headache are relieved by treating the eyes or other peripheral organs," and "sick headache having all the clinical features of migraine is often a reflex neurosis of ocular origin." How bitter must have been that medicine for

†But not acknowledged or referred to by him,—see *Am. Med.* April 9, 1904.

the distinguished gentlemen responsible for the meeting!

It needed only the hearty baritones of two famous oculists to pronounce the benediction of the burial service with fitting conclusiveness. Dr. Knapp is credited with the profoundly ludicrous remark that "eyestrain is due to over-exertion of the eye," and Dr. de Schweinitz returned to Philadelphia after having said that he was "glad of the firm stand taken by the Academy on the conservative side." The report does not add that the corpse of the criminal came to life and also returned to Philadelphia, where it is still laughing cheerily at the fun he had, though sorry for the fate of the migrainous patients in and about New York. His was simply a case of suspended animation due to a severe attack of migraine, because he had forgotten his Philadelphia spectacles.

Those medical journals which have shown the most unqualified disgust and bitterness against the eyestrain theory and theorists are, in the order of their violence, *The Medical News*, *The Medical Brief*, *Modern Medical Science* (an anti-vaccination and pro-bovine publication), *The Medical Record*, *The Homeopathic Recorder* and *The Postgraduate*. Others preserve some trace at least of good manners and caution, but with these neither is to be found. The first mentioned periodical goes out of its way with rage and most impolitic compliment, to demolish and rend, in three long, over-long editorials. In neither does it tell its readers anything about the arguments or intention of the writer so heartily despised. A gathering of the scurrilous epithets indulged in by the hasty editor would fill a page, and would prove uninteresting except to makers of slang dictionaries, and to yellow newspaper reporters. However, one is at least capable of understanding this excerpt:

"We are content to leave these papers to the judgment to which the scientific world will undoubtedly subject them, and to the oblivion to which it will eventually consign them. Writing them down would be a work of supererogation in the case of literary products which are fore-ordained to perish. The author's screed should have been consigned to the waste-basket. We live in just the age for these things. The times are prolific in all sorts of "healers" who play their antics, literary or oratorical, before the public in their own ways. Dowie and Mrs. Eddy are, of course, outside the pale of rational criticism, but unfortunately there

are spectacular prophets within the ranks of the medical profession itself, and these do not scruple to distort facts, to originate fantastic theories, to use exaggerated language, and to indulge in coarse invective, Dowie-like, etc.'—*Medical News*, Nov, 14, 1903.

"An epidemic of fantastic belief," is the characterization of the *Postgraduate*, and it is a sufficient self-characterization of its writer. Cynical persiflage, of course, is expected of the *Medical Record*, but its usual good wit was rendered bitter by too serious a desire to hit hard the "furious rider of this hobby." "It cannot be productive of good" of the *New York Medical Journal*, fails to suggest any possible harm that could come of trying glasses on a patient who has "a functional disease whose nature is unknown," and which is confessedly incurable by any other method.

The Boston Medical and Surgical Journal admits all that any one but an "extremist" and "exaggerator" could desire, at least all that I desire, but still charges extremism, and reiterates its expression, "an overworked theory." This is the burden of so many reviewers that a word or two may be replied. All who take this position are so strangely and furiously set upon denunciation of the exaggeration that they quite forget the admissions they have made of "essentially right," "fundamentally true," "eyestrain is indeed a cause of many distressing ailments," "the eyes are, it is true, the source of much cerebral and systemic disease," etc. Why does the truth at the foundation concern them so little, and the "overemphasis" concern them so much? If there is a great truth "overestimated," and "overworked," why not bring to the absolute deniers and ignorers the knowledge of the truth in the "hobby-rider's" contention, and not encourage them in their delusion by exaggeration of the oculist's exaggeration? This class of critics forget the patient who, through the local physician, is in reality counselled to be neglected, and to be continued in his suffering. This favorite expression is "it will do harm," but what conceivable harm it could possibly do to let the oculist try, they never explain. If there are only a dozen instead of thousands or millions of patients needlessly suffering [from migraine and other eyestrain effects, then the many cases in which the oculist fails are not "harmed" much or any, and the dozen cured are no longer an "opprobrium of medicine." Is it not worth while

to cure the twelve? How could they be cured except by making the test? There is, indeed, a negative exaggeration, a minus enthusiasm operating "inversely as the square of distance," which far more than counteracts the plus exaggerator. This sort of conservatism is active against every discovery and is a great brake on the wheels of progress.

But when the exaggerator is finally found to be right the grudging admissions previously muttered in parenthesis and aside permit the man at the brake to cry, "I always said so! I pulled the wagon!"

From the mouth of the discriminating scientist the counsel of perfection against misstatement and exaggeration comes with grace and must be received with graciousness. But from the editor of a house-organ "medical" journal one naturally gives it scant courtesy. The sale of one's professional service as a figure-head to enable mercantile firms to make money out of the profession's disorganization and affliction does not encourage confidence in the editorial science or ethics. When medical men become organized they will not donate forever out of their control their literature to commercial firms which by the gifts make immense wealth, while the writers remain as poor as ever. It is precisely these editors of these journals who misquote and lie about those they do not approve of.

If you do not "train with their crowd," if you do not buy the special brand of secret nostrums, or of books, etc., advocated by the editor, or by his manufacturers and publishers, it will be impossible to get any sort of justice done or errors and misrepresentations corrected. The most glaring and wide-of-the-mark misstatements and misquotations, instead of being corrected, will be repeated and added to. Point out to the rabid editor these "errors" and he will not publish your statement and certainly not acknowledge his "mistakes." You have never implied that more than a small percent of insanity, or epilepsy is due to eyestrain, you may have only suggested that criminality may be due to that cause, and yet these editorial and review writers will unblushingly tell their readers that you say all crime, all epilepsy, all insanity, etc., are caused by lack of a pince-nez. The book reviewed may contain the clearest cautions against exaggeration, may expressly state the "mays," "the small proportion," "the minority of diseases so caused, etc.," it matters

not. "Any club to hit a mad dog!" I never yet succeeded in getting but one editor to acknowledge a misstatement of this kind. He had said I claimed that eyestrain was the cause of cancer. He finally confessed that this error was entirely a product of his imagination. But this model man was not the editor of a "house-organ."

When the real question reaches conscience, as to "exaggeration" it must of course be scrutinizingly considered, even though the questioner is interested not in the patient's sufferings, or in the fundamental truth of the matter. Accuracy of statement is so important that its want will excuse neither *tu quoque* nor over-enthusiasm. But it is evident that it can be decided only by testing, and by the verdict of posterity. Neither asseverations of the enthusiastic nor denials of the conservative settle the doubt. All that the affirmer wishes is to get the denier to put the matter to the test. The clinical test is the only one in medicine. Have these patients been carefully tested by a believer in the eyestrain theory, one who has his reputation to lose if he fails? Only then will the truth or error of the theory be demonstrated.

The critic who answers all argument by charges of "exaggeration" and "hobbyriding" relies usually on "the consensus of opinion of the leading authorities," in other words, appeals to established belief, prejudice, in short, to back up his charge of "overworked theory." And it is precisely authority which the truth-discoverer disallows. He looks into the history of every discovery of medicine and science and finds the established opinions have been erroneous or incomplete. How could it be otherwise? If the existing doctrine were true, what need or right would he have to supplant it with anything else? "Established opinion to the dogs!"—one almost says. The existing "authority" must be wrong if new truth is to be discovered, if progress is to be achieved, and unless all truth has been attained, and all error annulled. Huxley admirably stated this position when he wrote:

"The improver of natural knowledge absolutely refuses to acknowledge authority, as such. For him, skepticism is the highest of duties; blind faith the one unpardonable sin. And it cannot be otherwise, for every great advance in natural knowledge has involved the absolute rejection of authority.

the cherishing of the keenest skepticism, the annihilation of the spirit of blind faith; and the most ardent votary of science holds his firmest convictions, because his experience teaches him that whenever he chooses to bring these convictions into contact with their primary source, Nature—whenever he thinks fit to test them by appealing to experiment and to observation—Nature will confirm them. The man of science has learned to believe in justification, not by faith, but by verification."

Personally, I may differ from many who believe in varying degrees in the theory as regards the extent to which migraine, headache, digestional and assimilation diseases, etc., are due to ametropia. Unless those disagreeing have had an oculist's personal experience with something like 10,000 such cases, they are not as well fitted to judge as I. If they rely on the authority of neurologists and psychiatrists, their reliance is upon nonexperts and is misplaced. If they rely on the authority of old-fashioned ophthalmologists there are several answers, among which are these;

1. There are at least 78 reasons why glasses fail to cure—the first being that the disease in question may not be caused by eyestrain. But there are 77 others which pertain to the demonstrated and admitted carelessness in making refraction tests and in prescribing glasses, and in watching the patient afterward. Most of the 77 requisites are habitually disregarded by the majority of the oculists of the world. Most of them are openly scorned by the criers of exaggeration. It will not do to say, as does the editor of the *Medical Record*, and Dr. Sachs, that the 77 reasons are evidence of a "hedge," of being "driven into a corner," etc., for these 77 reasons are the conditions of accurate refraction, the *sine qua non* of the tests, without which the glasses might as well be worn before the mouth as before the eyes.

2. Chief among the reasons is the neglect of the principal condition causing eyestrain, on the part of the great majority of oculists of the world. This is the small error of refraction, and the methods and carefulness necessary to diagnose it with that accuracy which alone can cure. Good oculists well know that it is precisely these low and unsymmetric astigmatisms which are the most certain provokers of such systemic reflexes as headache, sick headache, denutrition, dyspepsia, morbid nervous phenomena, etc. Donders taught the neglect

of these low errors of refraction, and the ophthalmologic world has strangely persisted in an error which accurate physiologic and optical knowledge, as well as closely observed clinical facts, would have detected. In a recent number of the *Lancet*, the editor acknowledges that the English ophthalmologists still usually continue their indifference to the low error. A noteworthy illustration was given at the last meeting of the British Medical Association. Dr. Clarke, of London, epitomized his experience of 20 years in the treatment of myopia. He fully corrects the myopia; he does not correct astigmatism of less than 1 D., unless it would improve vision; he allows no reduction for near work from the "fully corrected" myopia; he thinks that excessive convergence is the main factor in increasing myopia. A more perfect combination of malobservation, poor logic, wrong views, and bad practice, could hardly be found.

3. The oculists who contend, for instance, that migraine is not due to eyestrain, speak, of course, from their own clinical experience. A greater number of good oculists say that migraine is, in their experience, frequently cured by glasses. The first class are thereby convicted, and self-convicted, of unskilled work. Negative testimony, alibis, etc., count for little in law, and for nothing in medicine. What sort of a physician is he who says migraine is generally, or even always curable, and then when thousands of migrainous patients come to him he cannot cure them? How long would such an oculist have any professional reputation or practice left? The patient-world of reputable oculists is not so stupidly foolish as that.

A great physician famous in America and Europe writes criticising nothing else except the advice that *all* children should have their eyes tested by a competent oculist. And yet he advises that whether they have toothache or not their teeth should be examined by the dentist! The ocular examinations are now advised by most physicians. The diseases due to the eyes are so subtle, so varying, so multiform in expression, and the organs affected are so remote from the eyes, that it is of the highest importance that the evils should be prevented by this simple method.

Another reviewer says the ametropia is due to the same cause as the neurasthenia, migraine, etc.—an error which could only arise from an ignorance as to what astigmatism

really is, and a return to the old fetiches of the neurologists, —a “neuropathic tendency,” a “morbid predisposition,” “degeneracy.” etc. Even admitting the fun and nonsense of the view that corneal curves and ocular measurements are produced by headache and vomiting, that does not lessen the duty of attempting to discover the cause of “that disease (migraine) whose nature is unknown” (Osler). The “neuropathic predisposition” is the ultimate reliance of the hard-pressed neurologist. Upon that die his whole scientific fortune is staked. Well then, he is certainly doomed to bankruptcy! For a capable refractionist could make a great reputation and income if he could be allowed his way with the neurologist's patients before they consult him, or even afterward. There would certainly be an end of many rest-cure establishments, private hospitals, and sanitariums.

Two reviewers have affected to speak as defenders of the sacred medical profession against the criticism that some of its members have been in the wrong in opposing new medical truth. These self-appointed defenders of the faith jauntily mounted their Rosinantes, and cantered forth to what they thought an easy victory. The truth of the matter did not concern them. Theirs was the cheap bravado of men with a disciplined army behind them and a supposed poor Falstaffian rabble in front of them. But they faced the wrong direction. It was wrongly thought to be war, and it was very far from magnificence. It was mock-heroism and pseudop professionalism. There proved to be no Falstaff, no enemy in fact, and Rosinante was put back in the stable, while badges commemorating the *Defenders of the Faith* were being made. The medical profession, I admit, is the best of all, and there are more noble-minded and clean-hearted men in it than in any other. But there are others of very different character. And all of us are human, quite prone to occasional error and sometimes even to sin. It is a sacred calling, but those who think it so must disavow and disown its sycophantic parasites who flatter its vices and perpetuate its errors; who encourage the seekers after offices and consultation practices, and who care far less for medical truth than they do for personal success.

As I write an excellent illustration comes to my hand of a certain condition of mind and of the methods of expressing

it.* I had just been treating a patient who had been under the care of an orthopedic surgeon of national fame. When I tested the eyes, I found the girl's astigmatism in the dominant eye was 15° and in the nondominant it was 180° . I called the parents to one side and told them that in the vast majority of cases with such axes of astigmatism there was generally found a tilting of the head to one side, an elevation of one shoulder, etc., from childhood, with resultant spinal curvature. I asked if this girl (of 18) had not inclined her head to the left, elevated the right shoulder, and if she had any spinal curvature. Then came the family tragedy! The child had done as described from the age of 8, and had been under the care of the great Dr. — —, and of others, with daily devotion to physical culture methods, for many years. Spinal curvature was also said to have been inherited by her, several ancestors and relatives having had it. I at once wrote to the orthopedic authority, saying that I had discovered, I thought, the cause of his patient's scoliosis; I set forth the details, and supposed that he would be glad to learn of the, at least, possible new truth. The following was his reply;

"I have your letter and clipping, and thank you. Yes, I read your paper when it was published and I have a vague memory of some previous one. At the time I was tempted to write on scoliosis as a cause of unsymmetric astigmatism, but I feared to touch a sore place on your back, and out of pure love held my pen.

As to my patient, of which you speak, the parents have *not* done everything they could for the scoliosis. The child's Latin was far more important to them than her scoliosis. And I am quite sure that the cause of the unsymmetric astigmatism is the cause of the scoliosis, and not the astigmatism the cause of the scoliosis, or the scoliosis the cause of the astigmatism. With a bald father, who is a clergyman, and who has sufficient money for unnecessary charity and insufficient to pay half rates for treatment of his child; who

*In the spring of 1904 were published articles showing the origin of probably the larger proportion of all cases of spinal curvature in a peculiar axis of astigmatism which forces the child to hold the head to one side. Many months later great "medical journals" had not thought best to tell their readers a word about this highly important fact.

does not pay what he has promised to pay. With a fat mother who talks your arm off, and whose parents were mentally and physically defective, one may naturally expect in an *only* child very marked evidence of degeneracy. And you have the eye defect, the scoliosis, weak feet, and fat.

Why do we find such a large percentage of scoliosis among the children of clergymen and Jews? I believe it is degeneracy. What percentage of your cases of unsymmetric astigmatism have scoliosis?

If there is an eye man that you can interest in your theory I will send him abundant scoliotics for examination if he will send me an equal number of unsymmetric astygmatics for special examination.

Yours truly,

This is delightfully naive! It reminds one of Lincoln's famous saying about fooling some of the people all of the time, etc. Some "scientists" can not be fooled any of the time.

1. Here is a man who stands at the head of his specialty and yet who knows so little of astigmatism that he does not know how to spell the word itself, in a hand-written letter.

2. He misreports another orthopedic surgeon atrociously (in a subjoined abstract) as an ignoramus in his specialty, and then abuses him, saying that "he knows very little about lateral curvature of the spine."

3. He has not the faintest idea of what I have suggested as the cause of many of these cases of scoliosis. He traces it to "unsymmetric astigmatism," but it is in fact due to only one rare variety of unsymmetric astigmatism. The vastly greater number of cases of unsymmetric astigmatism could not possibly produce tilting of the head, and he does not know that the eye-strain of others, previously suggested as a cause of scoliosis, is an utterly different thing from that I have described.

4. He has not the least conception of what astigmatism optically and anatomically really consists. The idea that scoliosis or "degeneracy" could produce malcurvature of the cornea, would make the whole ophthalmic world break into derisive laughter.

5. When a crude mind cannot remedy a fault of temper or discover the cause of an obstinate disease, it tends to blame some one else. The attitude of scorn and contumely for a patient who persists in not being cured is, of course, highly justifiable, but it does not help matters "at all, at all." This hauteur is as ridiculous as it is unscientific; as self-stultifying as it is unkind. There are few patients who really "enjoy bad health," and who are contemptible "hysteries" and despicable "degenerates." They usually wish to be cured, and would be cured if we physicians were able to find the causes of their diseases. The physicians who thus speak contemptuously of patients—in the "God and a black-beetle" style—are those who not only do not know the cause of the functional diseases they cannot cure, but who also scorn the new views which might explain their causes.

6. The modern god of the neurologic and psychiatric nescience is "degeneracy." He is a poor graven image at best, and of barbaric type. His supposed existence explains nothing, and moreover he really does not exist. It would be sad indeed if Nordau and Lombroso were even the "most minor of minutest" prophets of evolution. The "stigmata of degeneration" of some modern pseudoscience will long be a mirth-provoking subject for those with a genuine sense of humor. In the present instance, it seems that Nordau and Co., have forgotten some of the principal evidences of "degeneracy," e. g., in the father—baldness; being a protestant clergyman; the possession of some money coupled with personal preferences as to charity; half-rates; nonpayment of debts. On the part of the mother, loquacity; defectiveness of parents (diagnosed as such by the scorners). On the part of the child, being the only one; unsymmetric "astigmatism;" scoliosis; weak feet; fat. (The girl is 5 feet 5 inches high, and weighs 145 pounds.) On the part of the world, degeneracy is due to being the children of clergymen and of Jews.

7. The reenactment of the old historic worn-out farce is exemplified admirably in this gentleman's attitude of settling the whole matter adversely, and with scorn or with kind and supercilious silence, when any new thought is suggested as to the origin and cure of an admittedly inexplainable disease—and in a special case in which there has been no cure, although the parents seem to have done too much

rather than too little in their long and earnest attempts to cure the child.

In a rough way, therefore, those opposed to new medical truth may be divided into three classes: 1. Those frankly and publicly opposed: 2. Those who cry, "exaggeration." 3. Those who are silent. Those violently against are the crude, dogmatic minds, incapable by nature of seeing or doing much for the progress of science or the good of their fellow men. They have the single merit of a partial frankness, and their bigotry in the long run helps the cause of truth some in calling the attention of a certain class to their extremism. The criers of exaggeration are more harmful by their plan of damning with faint praise and thus aiding the lazy to be more indifferent. The silent men are the worst enemies of progress. The silent leader, whose silence is motivated upon a cunning selfishness, is the most guilty of all the murderers of new truth. In every city there are several or many "leading physicians" (general physicians and neurologists), looked up to, and their advice followed by their pupils, and by the rank and file of the profession. By their professorships, hospital and society positions, text-books, etc., they have secured and accepted their oracular and judicial powers. They control the minds of many others who are trying to secure such a future standing for themselves as the master now has. For 20 or 30 years these men have had placed before them the abundant clinical evidences and testimonies of reputable men, that eyestrain does produce varied and profound systemic symptoms and diseases. Not one of these authorities has done any frank, judicial weighing of the matter; not one has publicly stated his opinion. There is no evidence that one of them has thought it worth while to test its truth or falsity, or even to say that it should be tested. If it is wholly false they should have said so; if it is in part true, they should have said to their followers and pupils just how far they were prepared to assent and advise trial; if it is in part true, thousands of patients have been condemned to nonrelief by the silence. Not one has publicly stated that the cure depends upon at least 77 reasons, usually neglected by most of the oculists of the world. The opinions, concerning this subject of several of these silent men, are known to me. I have their letters or word-of-mouth consent to the essentials of the contention I and others have made.

But I am not permitted to name these men, nor to quote from their "confidential" admissions. In fact, even under the condition of "confidential communications," they would, perhaps, not consent to all that the eyestrain theorists have advocated.

They affect to think that we have gone a hundred times farther than we have really gone. Their mental vision is fixed upon an abstract scientific fact, forgetting that in medicine all is concrete and individual, and that neglect of a possible method of cure shows indifference to the sufferings of patients. One of the most well known of American physicians verbally confesses that the eyestrain advocates are "essentially right." He admits many marvellous cures by glasses of many and varied systemic conditions, but to say that "all and always such diseases are due to eyestrain, etc., No!" "No one ever contended they were," brings only continued public silence. Another has for a dozen or more years referred such cases, hundreds of them, and still does so, to one oculist after another, until the careful one is found who finally cures. He admits again "essentially" all that the most extreme of oculists would ask for—but he admits it only privately, when even the most modest public admission would immediately bring the matter to the test in a multitude of cases under the care of those who follow his advice. They continue unrelieved while even he admits that the trial of glasses would not do that strange mysterious "harm," so feared by many. Drugs, rest-cures, trips abroad, and a hundred devices of therapeutists of as many types—they do no "harm," but trying a pair of glasses is somehow dangerous, most dangerous advice!

It is a strange condition of mind, one, however, not inexplicable, one wholly unworthy of the positions these men occupy. It is in truth the logical, though callous, result of these positions—the effort to hold them or to secure higher ones. Perhaps the condition will pass away only with the better education of the profession; which will make a far larger number of men the equals of the "leaders;" then a justifiable individualism of the many will do away with the absurd dependance upon the authority which makes the public clamor for "the best and most famous consultant in ———."

Let it also be recognized that in science, and especially

in medical science, the self-assumed leaders who oppose new truth are criminals. It is time that we were frank and blunt about it. The illiterate may ignore without blame. A few medical men, even the mass, may also ignore, and deserve only a moderate censure. None, absolutely none, may oppose and denounce and vilify. Who does so of medical men is culpable.

But when leaders and authorities do this it is plain homicide, murder, at least in the second degree. For the function of a leader is precisely to judge rightly of just these things. For that he is looked up to, and his advice followed. This is the office he arrogates to himself; it was not thrust upon him; he assumed it, and the assumption was a guarantee, under penalty, of fitness, culture, learning, experience, and just judgment. He was under no obligation human or divine to render adverse judgment and to persecute. Wherever there is great power lodged in a man's hands, its bad use is or should be punished. We need a machinery to punish these false judges. Monuments should be raised to commemorate their shame, their vulgar egotism, and their professional crimes. It matters not to the patients dead of neglect and false judgment, whether it was homicide or murder of any degree, but to society and to the profession, it does matter. Who killed the thousands of mothers who needlessly died of puerperal fever, the millions who died of small pox, after Holmes and Semmelweiss and Jesty and Jenner had demonstrated the truth? There are today several millions of people as needlessly suffering the agonies of migraine: who are responsible? The names of a hundred learned editors, neurologists, oculists, and "leaders" in medicine could be given.

Although the scoffers and critics fill the public ear with their clamor it is quite probable that at the present time the believers in the eyestrain doctrine are more numerous and certainly more discriminating and modest, more truly conservative, in stating their belief, than the deniers. References to only a few of such testimonies happening to be present are the following:—Dr. Snell of Sheffield, England, in a masterly article in the *Lancet*¹ improved and enlarged and published as a separate volume, entitled *Eye-strain as a cause of Headache and Other Neuroses*;² Pronger, *Slight Errors of Refraction and their Influence on the Nervous System*;³

Browne and Stevenson, *Squint Occurring in Children*;⁴ Callan, *Migraine and Functional Headaches from Eyestrain*;⁵ Thomas, *Some Remote Effects of Eyestrain*;⁶ Stephenson, *Ocular Headaches*;⁷ Zimmermann, *Ocular Headache, and other Ocular Reflexes*;⁸ Harman, *Headaches*;⁹ Hinchelwood, *Some Observations, etc.*;¹⁰ Tours, *Eye-work in General Practice*.¹¹

1. Lancet, April 30, 1904.
2. Simpkin, Marshall, Hamilton Kent & Co. Ltd. London, 1904.
3. R. Ackrill. Harrogate, 1904.
4. Ballière, Tindall & Cox, London, 1904.
5. Jour. A. M. A., March 28, 1891.
6. Northwestern Lancet, June, 1903.
7. Medical Press & Circular, Feb. 4, 1903.
8. N. Y. Med. Journal, Nov. 21, 28, 1903.
9. The Med. Press, Nov. 18, 1903.
10. Glasgow Med. J., Jan., 1904.
11. Medical News. Nov. 3, 1900. Also another article entitled, *Ocular Reflex Neuroses (Abdominal Types)*—the reference to the Journal unfortunately lost.

A hundred other references might be cited if space permitted. I add a few quotations from some recent good journals, and capable ophthalmologists and physicians; Dr. E. Jackson,¹ Dr. Robt. T. Edes,² Dr. W. F. Southard,³ The Pacific Medical Journal, Dr. H. M. Hurd,⁴ Dr. James W. Walker,⁵ The Cleveland Medical Journal,⁶ Dr. Frederick E. Cheney,⁷ The St. Paul Medical Journal,⁸ Dr. L. A. W. Alleman,⁹ Dr. W. H. Carmalt,¹⁰ Dr. A. G. Bennett,¹¹ Dr. S. D. Risley,¹² Dr. Talcott Williams,¹³ Dr. N. Senn,¹⁴ Dr. Solomon Solis Cohen.¹⁵

1. If the reader is familiar with what eyestrain can do, and does do, in the way of curtailing usefulness and destroying the pleasure of living, let him fairly ask whether many of these symptoms may not have been due to eyestrain? Whether it is not probable they were due to eyestrain? Whether, although the eyestrain explanation has been offered by Dr. Gould, we are not forced to admit that the only alternative to its acceptance is to relegate these cases to the Mysteries of Providence, or the unknown regions of neurology, and attempt no explanation of them whatever?—Colorado Medicine, Dr. E. Jackson, March, 1904.

2. The ciliary is the purest type of such a muscle and un

doubtedly its overaction, and especially its action which accomplishes its object for a time and with much difficulty, is the cause of more headaches than that of any other one.—Dr. Robert T. Edes, B. M. & S. J. March 3, 1904.

3. There is no specialist who has kept an accurate record of his cases for a series of years but will bear Dr. Gould out in his conclusions.—Pacific Medical Journal, April, 1904.

4. You have already made a deep impression upon the professional mind and I am sure you will reap an abundant reward in the consciousness that from now on all physicians will recognize the truth of your contention.—Dr. H. M. Hurd, Baltimore.

5. As a general practitioner I can say that the judicious employment of an expert refractionist will rob the practitioner of many of his chronic cases, and in place of fees he will have to be content with gratitude,—if the oculist does not get all of that. Our duty however, is none the less clear.—Dr. James W. Walker, J. A. M., March 28, 1903.

6. A distinct service to the profession at large—Cleveland Medical Jour.

7. As to sickheadaches I certainly expect to cure the greater proportion of them.—Dr. Frederick E. Cheney, Boston, Personal Letter.

8. That headache, insomnia, night terrors, nervous dyspepsia, sickheadache, migraine, and a host of other similar symptoms result from eyestrain, and are relieved by proper glasses, every physician, and especially every oculist is well aware.—St. Paul Med. Jour., March, 1904.

9. The lesson you are trying to teach the public is a much needed one, and the discussion to which your work has given rise has done more to enlighten the general public on the danger of eyestrain, which is not necessarily evidenced by eye-symptoms, than all the papers that have been written.—Dr. L. A. W. Alleman, Brooklyn.

10. What ophthalmologist has not had the same or similar experiences?—Dr. W. H. Carmalt, New Haven.

11. Heartily endorse your conclusions.—Dr. A. G. Bennett, Buffalo.

12. I can't see how any experienced ophthalmologist can fail to agree with Dr. Gould's thesis.—Dr. S. D. Risley.

13. It is a mystery to me why doctors do not see what is so plain.—Dr. Talcott Williams.

14. Nothing has done more toward calling the attention of the profession and the public to the baneful effects of eyestrain than these two books. * * * I have finished reading your wonderful book; I was so fascinated with it that I could not stop until I had read it from cover to cover. I have written and sent to the editor of the Jour. Am. Med. Assoc., a three-page review. [Not published.] I hope the book will reach every doctor in the world.—Dr. N. Senn, Chicago.

15. The dependence of migraine upon eyestrain as an exciting cause in a large number of cases can no longer be denied by the most doubting Thomas. * * * Unquestionably it is a truth of vast significance. Unquestionably physicians have not yet fully realized that significance.

Dr. Gould's great merit lies not so much in his individual theory of the causation of migraine as in his directing strongly the attention of the medical profession, and, it is to be hoped of workers in literature and science who are not physicians, to the necessity of the relief of eyestrain by suitable glasses, with recorection from time to time, as the refraction alters and the reflex disturbances recur; the other, and in some respects greater, being the importance of gathering all facts concerning the ill health of any individual into a comprehensive whole, rather than to consider detached fragments as things utterly apart. As the writer has elsewhere expressed the same thought, "the spokes are many, but the hub is one." This method applies indirectly even to pathologic accidents such as acute infections, but its direct bearing is of course upon what may be termed the basic condition of health or disorder.

Dr. Gould has shown that much, if not all, of the constant or recurring distress of a number of the leading spirits of the nineteenth century—distress otherwise mysterious and unaccountable—was in all probability due to refractive defects of the eyes and the consequent accommodational strain made necessary during work. It might, therefore, have been relieved in large part, if not entirely, by suitable glasses; and, this is the great, but therefore simple, lesson for physician and for patient. In emphasizing this lesson the author has emphasized old and unappreciated truth; he has also added to the sum of truth. It is a work well worth the doing; a work certainly not inferior to the invention of a new stain-

ing fluid, the synthesis of a new hypnotic drug, or the description of a new symptom-complex; a work, of which the true value will become more apparent as the years increase.—Dr. Solomon Solis-Cohen in *Science* April 29, 1904.

Quotations might be added from letters of the following physicians:—R. Matas, E. Souchon, W. S. Halstead, J. S. Prout, H. O. Reik, C. E. Ehinger, S. C. Ayres, Russell Murdoch, David Coggin, H. G. Sherman, W. F. Southard, H. F. Hansell, John Van Duyn, H. L. Swain, T. D. Crothers, T. H. Fenton, A. B. Adams, Peter A. Callan, Wm. H. Welch, Lew's H. Taylor, Mary E. Bates, A. A. Eshner, W. C. Hollopeter, Baker (of Cleveland), Geo. F. Libby, F. W. Marlowe, Geo. F. Case, J. W. Putnam.

Reviews accepting the eyestrain theory, and favoring the general view have appeared in *The Harvard Graduates' Magazine*, *Bulletin of the American Academy of Medicine*, *Ft. Wayne Medical Journal*, *Medical Review of Reviews*, *Canadian Journal of Medicine and Surgery*, *California Medical Journal*, *St. Paul Medical Journal*, *Dublin Medical Journal*, *Medical Press and Circular*, *The Lancet*, *Bulletin of the Chicago Health Department*, *Medical Bulletin*, *The Practitioner*, *The Nation*, *Cleveland Medical Journal*, *Quarterly Medical Journal*, *Wisconsin Medical Recorder*, *California State Medical Journal*, *Medical Council*, *Mind*, *The General Practitioner*, *Treatment*, etc.

Especially would I call attention to the opinion of one who has for about half a century been one of America's leading refractionists, an honored physician of St. Louis, the Dean, one might say, of the oculists of our country, Dr. John Green:

DEAR DR. GOULD:*

I have read your two volumes of "Biographic Clinics" with great interest and have gained much instruction from them. I regard them as a very important contribution to a just appreciation of the distinguished men and women whose lives you have so sympathetically studied.

The fact that the commonest ocular defects may give rise to morbid states, such as you have depicted has impressed itself upon ophthalmic specialists before it was recognized, and urged upon the medical profession in the classical essay

*From a private letter, with privilege to use publicly.

of Dr. S. Weir Mitchell, *American Journal of the Medical Sciences*, April, 1876. In the nine illustrative cases reported in that paper the trains of distressing and disabling reflex symptoms clearly parallel those analyzed by you in the fourteen *Biographic Clinics*, but with this difference: In his cases the dominant etiological factor was discovered before irreparable damage had been done, and relief followed the timely prescription of appropriate glasses; in the lives which you have discussed, relief came only in advanced age, when accommodation ceases from troubling.

To me the central and very significant fact is that the protracted sufferings, always alleviated by rest from eye work and always recurring with the resumption of studious pursuits, as portrayed in the several biographies from which you have culled, are such as ophthalmic practitioners recognize as dependent, in many persons, on common ocular defects, and as preventable or curable by properly directed optical treatment.

It cannot be too strongly impressed on all intelligent persons, whether physicians or workers in other fields, that the demands made upon the eyes in modern life are much greater than the visual apparatus, when of only average structural perfection, can meet effectively and safely. The lesson which I have learned from forty years of continuous study of the anomalies of accommodation and refraction is precisely in the line of your teaching, namely, that no degree of anisometropia or of astigmatism can be regarded as too small to demand accurate correction in persons compelled to use the eyes continuously, or in patients suffering from either so-called asthenopic symptoms, or from headache or other reflex disorders induced or aggravated by eye work. Neither can I accord any measure of assent to the notion that a short term of attendance at a postgraduate school, or any period of apprenticeship in selling eye-glasses and spectacles, can qualify an uneducated or, at best, a crudely educated man to do work which often taxes my own powers to the utmost, and in which I find that the continued cooperation of the patient, by returning promptly for further advice when anything goes wrong and by permitting the necessary periodical revision of his optic correction, is indispensable.

It is surely not an extravagant contention that eyes which do not perform their function perfectly in all respects and

under all conditions, or whose use is attended or followed either by local disturbances or by headache, nausea, insomnia, or other reflex manifestations, ought, without exception, to be promptly and critically examined. That such examination will very often bring to light a previously unrecognized ocular defect, and so point the way to urgently needed relief through wearing properly chosen and properly adjusted spectacles, needs only to be stated to command assent. The knowledge that relief from headache may come through wearing glasses is becoming more and more widely diffused; but comparatively few physicians have learned, as yet, to recognize the protean forms which reflex disorders of ocular origin may take on, or to estimate at its true value the service which a wise and conscientious ophthalmic specialist may be able to render.

The investigation and treatment of functional disorders dependent on structural imperfections of the visual organs call for the exercise of the minutest care, and often of almost infinite tact and patience. That these essential qualifications are sometimes conspicuously lacking in men eminent for their achievements along other lines is also true. Careless or perfunctory refractive work by an ophthalmic specialist will yield no better results than similarly defective work done by persons of inferior scientific attainments and of vastly less reputation. The intelligent and painstaking pioneer work of Ezra Dyer; the invention and employment of new aids to diagnosis by William Thomson; the frank recognition and just appreciation by S. Weir Mitchell, of the far-reaching benefits rendered, in his reported cases, by William Thomson, William F. Norris and George C. Harlan; and lastly, the continued devotion to the cultivation of accurate methods by a long line of careful investigators down to the present day, make up a sum of achievement by Philadelphia men which may be regarded as more than sufficient to justify the recognition of a distinctive Philadelphia School.

The personal sufferings of Ambroise Paré and of Percivall Pott were the means of enriching surgical literature by two illuminating chapters on compound fracture. Your own early experience of the torments and disabilities incident to a too long delayed diagnosis and correction of a complicated ametropia gives you, also, the right to speak forcibly and with authority.

Were not the Hebrew prophets decried, in their day, as enthusiasts?

JOHN GREEN.

HAAB'S GIANT MAGNET THE BEST MEANS TO EXTRACT FROM THE VITREOUS STEEL OR IRON WHICH ENTERED THROUGH THE CORNEA.

By N. J. WEILL, M. D.,

PITTSBURGH, PA.

The ease with which the Haab magnet attracts from the vitreous, without injury to the crystalline lens, splinters of iron or steel into the anterior chamber, from which location they are so easily removed, prompts citing a few examples. There is no danger of the magnet attracting too forcibly, since the strength of the giant magnet can be regulated with a rheostatic arrangement and when we start with the eye, in the direction we desire the splinter to travel, approximately two inches from and gradually approach the magnet.

In all cases it is well to administer the mydriatic frequently during the two hours preceding the operation of attracting the splinter, to dilate the pupil to its maximum, in order that the iris shall not interfere with the passage of the splinter into or from the anterior chamber. In most instances of steel injuries, when the iris has been penetrated, the splinter is still lodged posterior to the iris. The dimensions of the original wound often give us a fair idea of the size of the splinter, even when the lens or vitreous are not clear and hide it from our view. The treatment of the injured eye, prior either to the test to, or the operation of extracting the splinter with the giant magnet, differ in no way. In the trial we have a means full as reliable as the X-Ray to diagnose the presence of a splinter of steel that we are desirous of extracting, and how much simpler!

How much better must the ultimate result be when the already weakened vitreous encircling a piece of steel which entered through the cornea is *not* interfered with by a scleral opening for its extraction, as is usually necessary with less powerful instruments. When the steel in the eye is anterior

to the vitreous, the corneal route is the natural one for its extraction and if possible should be accomplished without the entry of any portion of the instrument into the anterior chamber. Those cases where the splinter enters the vitreous via the sclera, in which there is promise of some vision, are rarer and should invariably be extracted with the giant magnet, around the lens and through the cornea.

Recently I extracted for a man, of 40 years, in the manner already described,* around an apparently clear lens, a ragged, thin, quite, rectangular splinter 8x3 mm., weighing 0.005 gramme, which had perforated the cornea near the limbus, the iris just behind this and lodged in the vitreous. This injury occurred two days prior to his visit to my office and the corneal wound, holding the prolapsed iris, was already closed. Therefore, after the usual preparation and attracting the splinter into the anterior chamber, I made a sufficiently large corneal opening for its removal, being familiar with its dimensions, having located it in the vitreous and having seen it free in the anterior chamber. The extraction in this way not exposing the sclera, the choroid and the retina, positively lessens the liability to retinal detachment, which is greatly feared in all these cases. Furthermore, there is less danger of infecting the vitreous. The second day succeeding, the corneal exit was closed and the vision was fair.

In further support of this method are two cases which came under my care four months ago and are still under observation. The one presented a small pyramidal splinter weighing 0.01 gramme, which, after piercing the cornea and iris without injury to the lens, lodged in the vitreous. Five days elapsed from the time his sister noticed the pupil of the one eye larger than that of the other and he noted he could not see well with this eye, but it not paining him, deferred his visit to my office, until his mother found it convenient to accompany him. Patient can not recall an injury to this eye at any time. He works in a boiler shop. With the ophthalmoscope the splinter is readily seen in the lower vitreous. The giant magnet guided this sharp splinter forward around the lens, where it caught in the pupillary

*Two-Fold Use of Haab's Electro-Magnet In Eye Surgery. The Pennsylvania Medical Journal. August, 1902. Reference 4.

portion of the iris, although the pupil was dilated *ad maximum*. It might have been here disengaged and freed in the anterior chamber, had the patient, a boy of 14 years, been more courageous, but under the circumstances I first made an iridectomy and then extracted it. Today he has $\frac{1}{4}$ or more of normal vision, a normal field, and is still improving.

In the other case I extracted an exceedingly small splinter, weighing 0.0011 gramme, from the right eye of a man of 30 years, which had penetrated the crystalline lens and had lodged in the vitreous two days previously. The ens in this case being injured, I deliberately attempted to draw the splinter from the vitreous through the lens, but it choose the passage of *least* resistance, which is around the lens, through the suspensory ligament of the lens, into the anterior chamber. The traumatic cataract in this eye is absorbing slowly and today the patient counts fingers at 3 meters or more. With a less powerful magnet it would have been utterly impossible to attract this splinter in the manner here advocated, since it took the full strength of the giant magnet sometime to dislodge it. The slow restauration of this eye is expected from the history the patient gives of an injury about 2 years ago to his other eye, with which he has vision of about $\frac{3}{60}$.

A splinter, weighing over 0.04 gramme, which enters the vitreous through the cornea, probably injures the lens in entering. If the centre of the cornea is brought squarely to the point of the magnet, such a splinter may again pierce the lens in its anterior course and this is often desirable in that it hastens the flocculence of the lens, better preparing it for its absorption or removal through a corneal opening. If a similar splinter enters via the sclera, whether the wound is still open or is already closed, I believe it is best extracted through the cornea. Such an eye frequently suffers a retinal detachment later from loss of vitreous at the time of the injury.

To bear me out in urging the use of the giant magnet, I could cite more experiences with my instrument, but the foregoing may suffice toward encouraging the general application of the Haab giant magnet.

MICROCORNEA WITHOUT MICROPHTHALMOS.

REPORT OF A CASE.

By H. B. YOUNG, M. D.,

BURLINGTON, IOWA.

Microcornea with microphthalmos is the rule, but microcornea (congenital) in a globe otherwise normal in size is the exception, even if 2 mm. reductions in diameter are counted under this head. A good deal of uncertainty attends the measurement of the globe in situ. The judgment as to size must largely depend on the eye and finger of the observer; but, as will appear in the case to be related, another factor may be considered.

Ida C., a well grown girl of 16 years, came in July, 1903, to get better glasses. She had + 4.00 spherics, prescribed by Dr. Hamilton, in Wichita, 13 years ago; and + 2.50 spherics from Dr. Potter, in Leavenworth, 3 years ago. With the latter she could count fingers at 12 feet (R) and 6 feet (L). She could also read J 4 at three inches. With + 1.50 spherics V. was 20-200 (R), and fingers as before (L).

Inspection revealed convergent squint (L), lateral nystagmus, and corneae 7 mm. (vertical) by 5 mm. (horizontal) in diameter. There were also symmetrical colobomata downward, of irides and chorioideae. The globes were rather prominent, and so far as one could judge by palpation, normal in size.

How such a marked failure of development should occur in the anterior segment alone is remarkable. It is the more so, because the apparent reduction in the hypermetropia would indicate a disposition toward over-development of the globe in general.

THE EDUCATION OF THE BLIND, WITH ESPECIAL
REFERENCE TO THE USE OF THE MOON
ALPHABET.*

BY ROBERT C. MOON, M. D.,

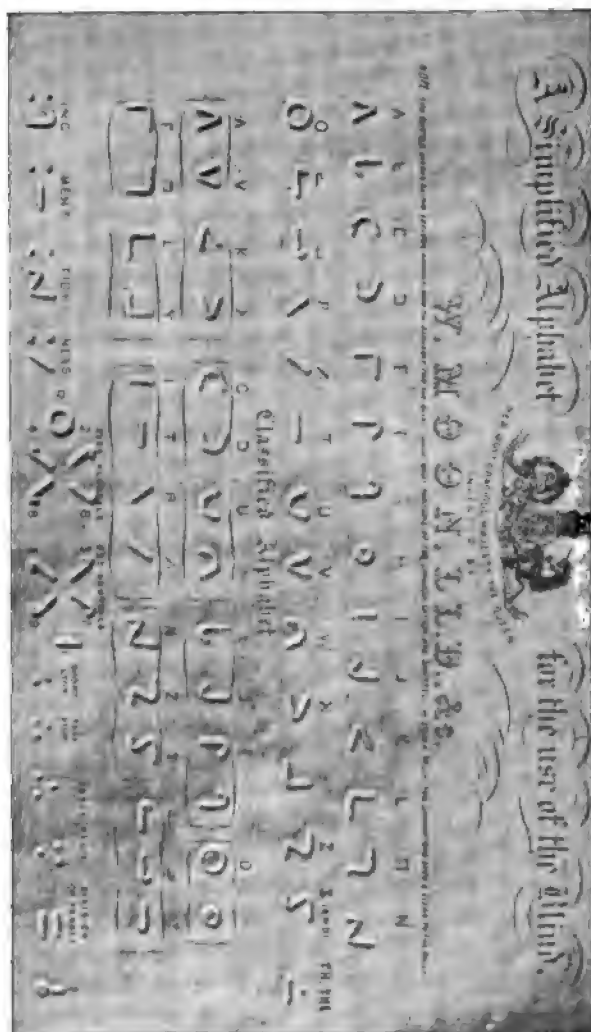
PHILADELPHIA.

Blindness is undoubtedly one of the greatest afflictions that can befall humanity, and our sympathies are invariably aroused when we see a person who is deprived of the precious gift of sight. When blindness occurs early in life, the remaining faculties of the child admit of marvellous training and development, as we witness in many of our schools for the blind; but far more frequently blindness, by accident or through disease, overtakes the adult man or woman of middle and advanced life. Such persons suffer a keener appreciation of the loss they have sustained, and, often times, they pass through a long period of sadness and discouragement, being cut off from the ordinary occupations and ways of men, without a ray of light or hope to cheer them in their future lives. When such are told that they can be taught to read again, they are generally incredulous, but if we can only induce them to place their fingers upon an O or an I or an L of the Moon embossed alphabet, they are astonished and delighted to recognize those old familiar letters and they easily learn the rest of the alphabet. In two or three lessons, they oftentimes become proficient readers, and hours, which once were spent in loneliness and despondency, are afterward occupied delightfully, in reading the embossed books with the fingers.

It may not be uninteresting to refer briefly to the earlier efforts which were made to provide embossed print for the blind.

Although for centuries various devices had been adopted for producing raised letters for the blind, the first successful attempt to emboss books for their use was made in Paris

*Address delivered at the World's Fair, St. Louis, Sept. 10, 1904.



PHOTOGRAPHED FROM DR. MOON'S EXPOSED ALPHABET FOR THE BLIND.

UNDER THE PATRONAGE OF

about one hundred and twenty years ago. In 1783, a band of blind musicians might have been seen performing in the streets of Paris. They all wore spectacles and stood in front of music stands. As they were pretending to read the music before them, and, from time to time, went through the form of turning over the pages which they could not see, the pity of Valentine Haüy—one of the spectators—was awakened, and he longed to place in their hands embossed books which they could feel for themselves. Availing himself of the suggestions and plans of his predecessors in this field of philanthropy, he produced metal types, consisting of large and small italics, from which he printed pages of embossed reading. His first pupil was a young man, who gained his living by begging at the door of a church; but he would not consent to receive instruction until he was guaranteed as much money as he was already gaining from sources of public charity. Haüy was greatly encouraged by his success in teaching this young man to read, and soon developed fresh methods of instructing the blind in other branches of education. His number of scholars rapidly increased to twenty-five, and with private and municipal assistance he was able, in 1785, to procure for them a house in the Rue Notre Dame Des Victoires, which may be considered as the pioneer institution for the instruction of the blind throughout the world.

During the next fifty years several other kinds of types were introduced for the use of the blind. To Mr. Gall, of Edinburgh, who, in 1827, commenced the preparation of embossed works in an angular type, belongs the honor of arousing the British public to a sense of its duty of providing reading for the blind; and a few years later, Mr. Alston, of Glasgow, gave fresh impetus to the work, by embossing the Bible and some elementary works in the Roman letter. The complicated forms of the characters adopted by him, were, however, found to be too difficult for the majority of the blind to decipher. Soon afterward, Mr. Lucas, a stenographer of Bristol, and Mr. Frere, of Blackheath, realizing this fact, introduced new and simpler alphabets, but as their systems were stenographic or phonetic, they proved to be unsuited to the capacity of many—especially the aged and nervous blind.

Such is a brief sketch of the progress which had been

made in providing embossed reading for the blind, prior to the year 1840, when a young man, whose sight had long been failing, was suddenly plunged into total darkness as he entered into manhood, and was preparing to study for the ministry. That young man afterward became Dr. William Moon, who was my father and who lived in the town of Brighton, England. Upon his becoming blind, he lost no time in vain repining, but immediately gave his attention to mastering the various systems of embossed reading, to which we have referred. This accomplished, he began to seek out and teach other blind persons to read. But, as he soon found difficulties in teaching his pupils, he was led to devise an easier plan of reading, which was readily acquired by a lad, who had, in vain, endeavored for five years, to learn by the other systems.

This new type—now known as the “Moon Type”—has an alphabet, consisting of letters of very simple construction, combined with a full orthography. The characters are composed principally of the Roman letters, in their original or in slightly modified forms; and where some of the more complex letters of the Roman alphabet could not be altered with advantage, new characters are substituted for them. The alphabet consists of only nine characters, placed in various positions. A glance at it will show that it is composed of the simplest geometrical forms, such as the straight line, the acute and right angle, the circle and the semi-circle. In order that the reader shall not lose his place, the first line is read from left to right; and the second from right to left, and so on. The finger is guided by a curved bracket from the end of the line to the one below.

The more the type was tried, the more encouraged was its young inventor by its success, and its adaptability to the needs of the blind. It soon became evident that Dr. Moon's future life was destined to be devoted to their welfare, and for more than half a century he devoted himself with untiring energy to the task of preparing for them a literature embossed in his own simple and easily deciphered type. Not long before his death, in 1894, he said to a visitor who called to see him at his home in Brighton: “It has been for me a long night, but a bright day. God has been pleased to give me the talent of blindness, and I have tried to do my best to

use my talent, instead of burying it in the napkin of despair and hopelessness."

Dr. Moon adapted his embossed alphabet to 400 languages and dialects, and the books have been disseminated so widely, that it may be truly said, "the sun never sets upon them." Besides being found in almost every part of the United Kingdom, they have spread to every continent of the globe.

Whilst preparing some embossed literature in the Chinese, Dr. Moon spent an evening with Mr. Hochee, a Chinese gentleman, who repeated to him the Lord's prayer in the Pekin colloquial. The next evening Dr. Moon called to see Mr. Hochee, and after unfolding an embossed paper, which he had had prepared during the day, commenced to read WOO TING FOO, but, before he could proceed, Mr. Hochee sprang from his chair and placing one hand on Dr. Moon's back and the other on his chest, began to pat him vigorously, while he exclaimed: "Oh, oo got our fader, oo got our fader, oo *shall* have some tea." That was sufficient to convince Dr. Moon that he was working on proper lines. Since that time, several portions of the Holy Scripture have been embossed in the Pekin, Ningpo and Shanghai dialects of the Chinese language.

The total number of volumes issued in this type, since the commencement of the work in 1847 up to the present time (1904), has been 240,000 and 66,250 stereotyped plates have been prepared and are carefully preserved at the embossing establishment, 104 Queen's Road, Brighton, England.

The literature in the "Moon" Type now comprises, in addition to the Bible and many separate Chapters and Psalms in English, many volumes of an educational and entertaining character, including biographical, poetical, historical and astronomical works.

There are many thousands of the blind in all parts of the world, who are now finding pleasure and comfort in reading these embossed books, which are an inexpressible solace to them in their weary and lonesome hours. A large proportion of these blind persons had previously tried, in vain, to learn to read by the dotted or Roman letter systems.

Many of the readers are ninety years old, some are nine-five, and it is gratifying to find that, in the evening of

life, they can gather so much pleasure and comfort from the books.

Scarcely a day passes but what some fresh testimony to their usefulness and comfort is received. A simple, but touching tribute to the appreciation of his work was contained in a message sent by a blind man to Dr. Moon: "Oh, Sir," he wrote, "when I meet you in heaven, I will take you to our Lord, and tell Him it was through your books I found my way there." A little girl in Cairo, who had read a copy of the Psalms, in Arabic, which Dr. Moon had prepared, sent this message to him by a gentleman going to England: "Please tell Dr. Moon, when you see him, I am so hungry, that I want all the Bible." Mrs. Bowen Thompson, who established some Syrian schools in Beyrout, says: "That some twenty of the little girls learnt to read the Moon Arabic Alphabet and specimen page in less than an hour!"

It should be clearly understood, that prior to the introduction of the Moon type, but few of the adults, who formed the vast majority, could read the books previously printed, because their touch was seldom acute enough to decipher the embossed letters, and they intellectually failed to comprehend and remember the many contractions with which some of the systems were burdened.

It having become possible, by the introduction of the Moon type, to teach the adult blind to read, Dr. Moon and a lady friend in 1856, started, in London, the first organized Home Teaching Society for the Blind, with a circulating library of embossed books in the Moon type. The Society employed a teacher to find out and instruct the blind in their homes, for it was soon realized that most of the adult blind shrank from appearing much in public, and but few would stir out of doors without a guide. The London Home Teaching Society at once proved to be a great success, and similar societies were soon started in other places. In various parts of Great Britain and Ireland, America, Australia, and other countries, there are at the present time about 80 Home Teaching Societies, and Free Lending Libraries of the Moon books; and teachers (many of them blind) are engaged in visiting the blind at their own homes—teaching them to read, and changing their books. An idea of the magnitude and importance of the work effected by these Societies, may be gathered from the fact that the London

Home Teaching Society, founded in 1856, now (1904) employs 14 teachers, who have nearly 2,000 blind readers on their registers. During 1902 the teachers in London paid 36,000 visits and loaned to the blind 33,000 volumes. The Home Teaching Societies have done much to brighten the lives of those unfortunates who, after knowing the blessings of sight and years of activity, have become imprisoned in that outward darkness which can be penetrated only by the light from within. These are far more unfortunate than those who have never seen, because they must accustom themselves to an entire change of life. All their old interests and employments are gone, and mostly the loss of the latter means their being thrown on the charity of friends, relatives, or the cold, cold world.

Accompanied, either by myself or my sister, our father, Dr. William Moon, visited many foreign countries on behalf of the blind; at various times travelling through Holland, Germany, France and Sweden, besides making an extended tour of the United States in 1882. During our stay in Sweden, my father and I had the honor accorded us of an audience of Her Majesty, the Queen of Sweden, and H. R. H. the Princess Eugenie (sister to the King). They were greatly interested in my father's plans for the education and amelioration of the condition of the blind. It may also be remarked that the Society which Dr. Moon organized at Brighton for the embossing of his books, and to which his services throughout his long life were given gratuitously, was under the special patronage of Her Most Gracious Majesty, the Queen of Great Britain. For many years previous to his death, in addition to accompanying our father in several of his missionary tours, my sister, Miss Moon, was his devoted and faithful coadjutor in the work for the blind in Brighton, helping in a very practical way, not only to provide for the spiritual, but also the temporal needs of the blind. Since our father's death in 1894, the superintendence and responsibility of the great and world wide work for the blind, which he had established, devolved entirely upon my sister, and she continues to conduct it, at the headquarters of the Moon Society for the Blind in the town of Brighton, England.

The public in general has but a vague idea of the blind

population, and what is being done for the instruction and welfare of that sadly afflicted class.

Many persons know of the existence of "Schools for the Blind," and they have witnessed the wonderful things which are being done for, and by the blind children. They have heard the children read and sing. They have seen them playing musical instruments and making baskets and other things, but few have stopped to realize what a small proportion of the total blind population those children in the schools represent, their number being only about 4,500, whilst there are in all 80,000 blind persons in these United States. The schools are doing grand and efficient work amongst the children who constitute the 18 per cent. under 21 years, which is the age-limit for their reception into those institutions; but the public mind has hardly commenced to realize that there are 66,000 blind adults, or 82 per cent. of the blind population, who have, in many instances, become physically and mentally wrecked by accident or disease. Their sense of touch is generally so dulled, that they are unable to decipher the Roman line letter or the dotted type used by the young, or the nervous system has become so shattered that they are unequal to the task of committing to memory a host of contractions, as employed in some of the dotted systems.

It will especially interest this audience to hear that "Home Teaching" has proved as suited to the needs of the blind of the United States as to those in Great Britain, for the conditions under which the blind live, and their ability to decipher types, are much the same in this country as in England.

In 1882 at the invitation of the Principal of the Pennsylvania Institution for Instructing the Blind in Philadelphia, my father and sister visited that city, and soon discovered the need for Home Teaching of the blind. They found in Mr. John P. Rhoads, the Treasurer of the Pennsylvania Bible Society, an enthusiastic supporter of the plan. He was instrumental in forming a Home Teaching Society there, and he personally undertook the superintendence, in the Bible House, of a library of embossed books in the Moon type, as well as of a teacher who was sent to the homes of the blind for the purpose of teaching them to read, and periodically exchanging their books for them. Mr. Rhoads

continued most successfully to carry on the work for sixteen years, but in order that it might be placed upon a more permanent basis, the Society was re-organized in 1898; and was legally incorporated in 1901. Since its re-organization, the Society has enjoyed the valuable co-operation of the Trustees of the Free Library of Philadelphia, who have taken charge of the library of embossed books belonging to this Society for the blind, and now the officials of the Free Library superintend the loaning of the Society's books to the blind upon the roll of readers, all expenses connected with the Home Teaching part of the work, and the circulation of books outside of Philadelphia, being paid by the Pennsylvania Home Teaching Society for the Blind. It is important that I should here say that the Society's efforts are not by any means confined to Philadelphia. Constantly the embossed books, and information about the Pennsylvania Home Teaching Society and its library, are being sent, free of charge, to various parts of Pennsylvania and to places in other States of the Union, extending from the Atlantic to the Pacific, and from the ice fields of Alaska to the islands of the tropics. Among the readers are several deaf, dumb and blind persons, who have been taught to read in from one to four lessons.

The library of the Pennsylvania Home Teaching Society's embossed works will be found in the Free Library, 1217-1221 Chestnut Street, Philadelphia, where the books are kept in a room especially set apart for the purposes of this work. The room is also open to the blind as a reading room, and such persons are welcome to the free use of the library. Those who live in Philadelphia, or its vicinity, are taught, as heretofore, at their homes, without charge, by the visitors engaged by the Home Teaching Society for that special purpose. Those blind persons who are able to do so, call at, or send to, to the library for an exchange of books. Those who cannot do so, have their books periodically exchanged by the visiting teachers.

I am happy to announce that by a recent Act of Congress (Act of April 27, 1904), embossed books or other reading matter, when sent by public institutions for the blind or public libraries as a loan to blind readers, can henceforth be transmitted in the United States mails, free of postage.

The Pennsylvania Home Teaching Society now employs one male and one female teacher, the female teacher devot-

ing her attention more especially to visiting and teaching the female blind. During 1903 the two teachers paid 2693 visits, and had 70 new pupils, most of whom became readers of the embossed books. Almost all of the scholars were elderly persons, and one of them was in his ninetieth year.

To this number we must add 121 more new blind persons who during the year, were enrolled as borrowers of books. These, with the previous readers, made a total of 621 upon the roll at the close of that year.

There were 4819 volumes issued from the Department for the Blind in the Free Library during 1903, of which number our teachers distributed 1,930 volumes, and 950 volumes were loaned and forwarded to blind persons in various parts of Pennsylvania and other States. No mere words can possibly express the delight of the blind upon receiving any new book with which they can pleasantly pass the hours, which would otherwise be monotonous and dreary.

Although I have but incidentally referred to the Braille and other dotted systems, I would not wish to convey the idea that I do not fully appreciate them, for my admiration for the French Braille type was aroused upon first seeing it in Paris nearly forty years ago, and I am delighted to see it in its modified form so well represented here to-day by the gifted pupils of the Illinois School.

As a rule, however, it is not advisable, at first, to attempt to teach adults to read by the Braille method, as we have known too many cases where it has proved a failure; but several intelligent adults who have had the sense of touch cultivated by the use of the Moon type, have afterward learned a dotted system. The Moon type, however, invariably retains a warm place in their hearts, as having been the stepping stone to other things.

I must not omit to refer to the special effort which is being made by "The Pennsylvania Home Teaching Society for the Blind" to raise a "Publication Fund" of \$100,000. It is proposed to raise an endowment fund, the interest of which shall be devoted to the publication of new and interesting books in the Moon type for the blind. The blind crave a varied and entertaining literature, as much so as their more favored sighted brethren, and I trust that this Society's "Publication Fund" may soon swell to large proportions. The Society has already contributed \$150 toward

the cost of stereotyping "John Halifax, Gentleman," which is greatly enjoyed by our blind readers.

We would not however for a moment discourage the stereotyping of any favorite work at the expense of private individuals, for many of the books now in existence have been thus prepared. If one-half of the cost is subscribed for any book, the Moon Society for printing the books will meet the other half.

Recently, the Hon. John Hay, our Secretary of State, has in this way personally paid for the stereotyping in the Moon type of the able eulogium of William McKinley which he delivered before the Senate of the United States.

The authorities of this entrancing World's Fair, in which we are convened, have kindly granted the Pennsylvania Home Teaching Society valuable space in the section devoted to the blind, for an exhibit illustrating the plan of Home Teaching of the blind, and the Society is now making a display of a few of the embossed works published by the Moon Society for the blind, especially the type, so successfully used by this Society among the adult blind. One of our blind teachers from Philadelphia is present, and will remain for seven or eight weeks to demonstrate the method of home teaching, to answer inquiries and to instruct any blind persons who may desire to learn to read. This is deemed to be a golden opportunity for making known to persons from *every part of the world*, assembled at St. Louis, what *Home Teaching of the blind* means, and how successful it has proven in Philadelphia during the past twenty-two years. Thereby others may be encouraged and stimulated to return to their homes, determined to establish similar societies in their own neighborhoods.

But, I would be especially glad if one of the results of this exhibit should be the formation of a Home Teaching Society for the blind in the city of St. Louis where there must be a large number of adult blind persons needing just such help as it could afford. I have already had gratifying proof of the interest which is taken in this matter, and I shall be happy to give any explanation or suggestions to those who may be disposed to form an organization to carry out the plan.

Why should there not be a Missouri Home Teaching Society, as well as a Pennsylvania Home Teaching Society for the blind? A few friends banded together to promote this

object, would soon raise funds to purchase a complete library of books in the Moon type, and to secure a volunteer or paid teacher to visit and teach the blind at their own homes. There need be no expense for a library in which to place the works, or a librarian to operate it and distribute the books, for Mr. Crunden, of the Public Library, has been kind enough to assure me that he will be happy to co-operate, by receiving and distributing any books which may be deposited in his library by a Home Teaching organization, in the same way that the books are circulated in Philadelphia.

In addressing you, I have tried to present, in a condensed form, an account of the origin, progress and success of the Moon type for the blind, and I may appropriately conclude by quoting the words of a well known author, who visited its aged inventor a short time before his death. Thus he writes:

"They also serve who only stand and wait," wrote the blind poet more than two hundred years ago; but Dr. Moon surely read a new meaning in Milton's beautiful words. He was not contented with the patient service of standing and waiting, but for more than fifty years of total darkness, he gave himself up to work of the most strenuous, inspiring and energetic nature." The same writer concluded by saying: "In my time, and in the path of life which I have chosen for myself, it has been my good fortune to meet many of the most remarkable men of the day; and yet with the memory and full knowledge of what they have done, I do not hesitate to place in the very first rank of all these workers, Dr. William Moon, of Brighton, England." Thus wrote Mr. Blaithwaite, the celebrated Biographer. Surely the influence of such a life will go on:

"When a good man dies, for years beyond our ken,
The light he leaves behind him shines upon the paths of men."

My dear friends, I have said so much about the achievements of my beloved father, not with the motive of praising him, but with the object of encouraging all who are listening, to try to do something for others, however unfitted they may feel to undertake the task. If you need a suggestion, I would ask you to throw your energies, your influence, your talents into this Home Teaching work for the blind. Then, truly, you will find that:

"In blessing others, you have yourselves been blest."

A CASE OF UNILATERAL RETINITIS PIGMENTOSA.

BY ROBERT C. MOON, M. D.,

PHILADELPHIA.

Henry J., was first brought to me on January 8th, 1901. He was then 8 years old and was suffering from asthenopic symptoms. When in reverie the eyeballs were parallel, but upon looking intently at any object, even at a distance, a slight convergent strabismus was induced. He was examined under the influence of a mydriatic, and was found to need for full correction: O. D. = + 0.50 sph. \odot + 0.37 cyl. ax. 180°; O. S. = + 0.50 sph. \odot + 0.25 cyl. ax. 180°. The fundus of each eye was, at that time, apparently perfectly normal.

In August, 1904, the patient was again brought to me, his father having noticed, that although he made no complaint in reference to his sight, he was "constantly blinking his eyes."

Upon inquiry, it was found that the glasses ordered in 1901 had been broken for two years, and that ever since, their use had been discontinued. I, therefore, re-examined him under a mydriatic, and found the refraction to be about the same as in 1901, but, to my surprise, when I came to make the routine examination with the ophthalmoscope, I found that numerous pigment deposits were scattered over the upper equatorial region of the fundus of the left eye. Many resembled bone corpuscles, and in some places the pigment obscured the vessels. The optic nerve entrance was somewhat dull, but the vessels showed no marked change. The chorioidal vessels were visible in and around the pigmented area, which presented the typical appearance of Retinitis Pigmentosa. The right fundus oculi presented no trace of pigment deposit. With his correcting lenses the patient's visual acuity for either eye was $\frac{5}{4}$ and he could read the finest print, but whilst the field of vision of the

right eye was normal, that of the left was decidedly contracted, being limited to 52° downward—corresponding to the invasion of the pigmentary deposit upward.

A careful investigation revealed no traces of heredity, and there was no consanguinity of the parents. In December, 1903, several members of the J. family suffered severely from diphtheria, but Henry J. was only slightly affected. He received, however, the same antitoxin treatment as the rest of the family and made a rapid recovery.

Ophthalmoscopic examinations revealed nothing abnormal in the eye-grounds of the parents or the three sisters of the patient.

The unilateral character of the retinal pigmentation, and the fact that it was not apparent in 1901, seem to justify placing this case on record.

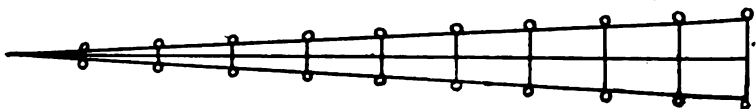
DETAILS OF A SCHEME FOR THE SUBJECTIVE MEASUREMENT OF THE PUPIL.

BY CLINTON T. COOKE, M. D.,

SEATTLE, WASHINGTON.

Of the various schemes for measuring the pupil by objective methods, the one described and figured by De Schweinitz (Am. Text-Book Eye, Ear, Nose and Throat) is probably as widely used and as free from error as any except the millimeter scale held in front of the eye and the apparent width of the pupil read off directly. The manifest impossibility of making accurate measurement by this method, together with the desirability of being able to estimate or measure accurately the excursions of the iris, has led to the experiments and measurements on which this paper is based.

1.—EXPERIMENT 1. Taking an ordinary visiting card and a pin, two series of stenopecic openings are to be made at equal intervals along two diverging lines intersecting at one end, at the other being 10 mm. apart. Thus:



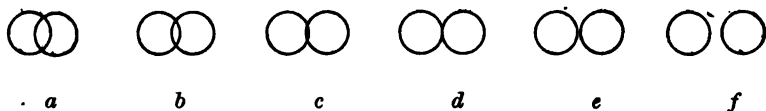
(These openings can be enlarged to a given size by a Theobald lachrymal probe.)

2. If this card be now held before a normal emmetropic eye, accommodated for distance, at an approximate distance of 13 mm., as in Scheiner's experiment, and the gaze be directed at some distant illuminated object as, for example, the sky, through these pairs of openings, the size of the field of vision will depend upon three chief variable factors: (3) The size of the openings in the card. (4) The size of the pupil. (5) The distance between the openings. The distance of the card from the cornea may also enter into the case,

but inasmuch, as a few millimeters, either way, does not alter the measurement of the pupil by more than a few hundredths of a millimeter, and as 13 mm. is a distance easily estimated or measured, further reference to this factor is omitted. (See on this point Tscherning, *Physiologic Optics*, p. 84, Principle of Badal.)

3. The size of the openings may be controlled easily. An opening 1 mm. in diameter at 13.7 mm. from the cornea, forms an angle of about 4° with a point on the cornea. An opening of 4 mm. at the same distance, forms an angle of about 16° . With a pupil 3 mm. in diameter, a *field* which has an angle of 16° is visible through a 1 mm. opening, and an angle of over 20° when seen through a 4 mm. opening. (The aperture of the eye is 20° with a 4 mm. pupil, a larger field being visible when the pupil is dilated.)

4. The size of the pupil varying, according to well-known conditions contracting to light, accommodation and converg-



ence, is the chief variable factor in determining the size of the field seen through a small opening, and because its measurement is accomplished by means of (5) the third variable factor, we will consider them together.

First, then, looking through the first pair of openings in the card, two circular fields will be seen, whose margins overlap. The segments included by the overlap allowing twice as much light to reach the retina seem brighter and better illuminated than the remainder of the circle, thus: (a). The next pair will overlap less, thus: (b). The third pair still less: (c). Presently a pair will be seen whose margins are tangent to each other, thus: (d). The next pair are separated (e), and the next are separated more yet: (f). Now the pair of fields, whose margins are just tangent to each other, is seen through two stenopeic openings, which are separated by opaque cardboard, and the width of cardboard between these two stenopeic openings is very nearly an exact measure of the size of the pupil. To prove this, and to calculate the error, which arises from the refraction by the

cornea and aqueous humor, is the object of this paper. The following diagrams show the course of the light rays, and, if correct, are proof of the correctness of the assertion just made. The calculation of the error follows.

6. In this diagram, which resembles somewhat Brewster's for determination of position of entoptic objects, the location of the screen being at the anterior focal point of the eye, the ray Rd may be considered as emanating from R^1 . This ray, after refraction, will run parallel to the nodal ray coming from the point R^1 . A similar construction determines the course of the ray SS^1 , likewise the course of the rays from T and V . It will be seen that no ray coming from a point higher than S or lower than R can enter the eye through the

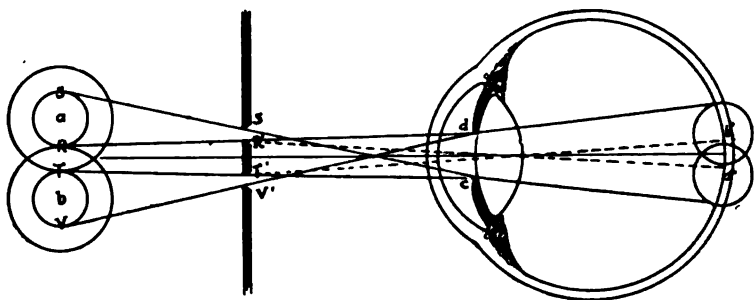


Diagram 1.

upper opening in the screen, hence with this screen the size of the field visible externally is limited by the size of the pupil. A similar remark applies to the rays TT^1 and VV^1 and the lower opening in the screen.

7. Light emanating from the portion of the circles a and b projected which lies between the points T and R strikes the retina between the points a^1 and b^1 , thus doubling the amount of light received. Therefore, the stimulus to the rods and cones being greater, we seem to see objects between T and R in a brighter light. It will be observed the distance between the openings in the screen is less than the diameter of the pupil.

8. In diagram 2 the openings in the screen are separated by a distance greater than the diameter of the pupil. Pro-

jection outward being through the nodal points, the adjacent margins of the fields of vision appear to be separated. The essential point, however, is that no ray of light parallel to the principal axis of the eye can reach the fovea, whereas in the conditions shown by diagram 1 this is possible. If in a diagram similar to this one in other respects the openings in the screen were indefinitely enlarged, while the inner margins were still separated by a distance greater than the diameter of the pupil, it would remain true that rays parallel to the principal axis could not reach the fovea.

9. In diagram 3, however, the circles *a* and *b* would appear to be tangent to one another because the margins of

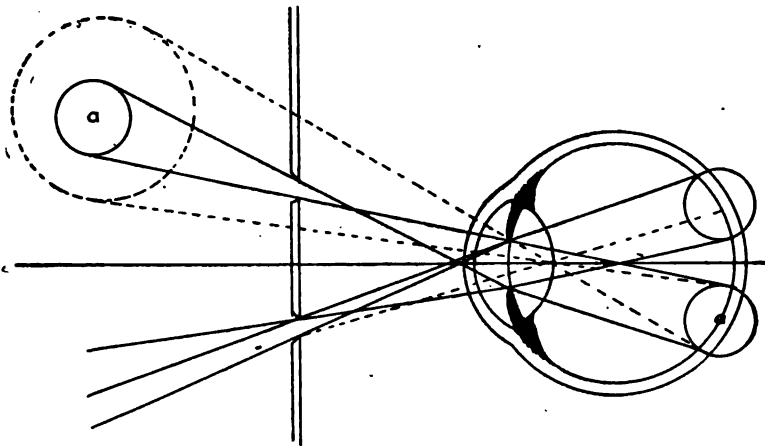


Diagram 2.

their images are in contact at the fovea, and this because the eye is by hypothesis normal and emmetropic. In such an eye rays parallel to the principal axis are focused on the fovea and, as remarked before, the projection outward of the image of this inner margin of these fields is through the nodal point. This is further shown by looking through a pair of openings, whose images overlap, at a fixed star, or at an electric light at a distance of, say, 100 meters, when it will appear single and at the point of fixation if the eye is emmetropic, or properly corrected, unless the openings are so small and near together as to cause the familiar lines due to interference. If the margins of the fields do not overlap

the star can be seen through only one circle at a time. (Scheiner's Experiment.)

10. In diagrams 1 and 2 no account has been taken of the refraction caused by the cornea and aqueous. This refraction necessitates a different construction and calculation for each stated diameter of the pupil.

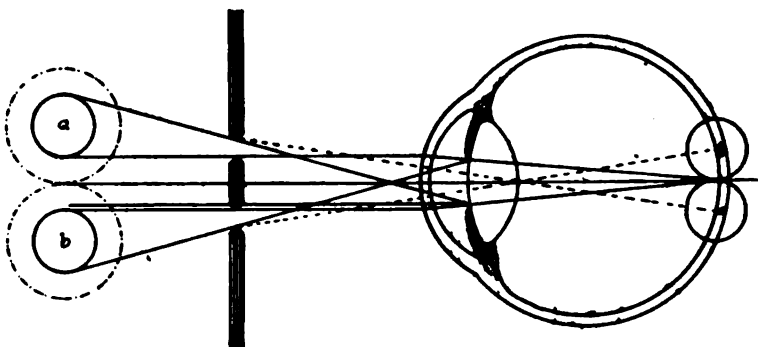
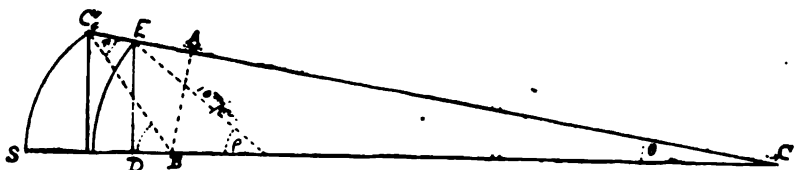


Diagram 3.



$$\begin{aligned}
 AB &= 3.451 \text{ mm} & AC &= 23.00 \text{ mm} & AC' &= 7.027 \text{ mm} & SC &= 3.107 \text{ mm} \\
 DE &= 4.00 \text{ mm} & BC &= 23.26 \text{ mm} & BC' &= 7.829 \text{ mm} \\
 \pi &= 26^\circ 9' 30'' & \rho &= 23^\circ 34' 40'' & \theta &= 8^\circ 32'
 \end{aligned}$$

Diagram 4.

The diffusion circles in ametropia must also be taken into account. For the present, the method of calculation of the distance between two openings in a card whose subtending visual fields appear to be tangent with a pupil of, say, 8 mm. will suffice. In this calculation it is necessary to be rather exact, because it is easy to measure within 0.25 mm. of the true size of the pupil. It will be necessary first to calculate

the distance between the plane of the anterior surface of the cornea and the plane of the pupil.

This distance is 3.6 mm. plus the versed sine of an arc whose chord is 8 mm. and whose radius is 10 mm. (These constants are after Landolt.) Half the angle ϕ is $23^{\circ} 34' 40''$, and the versed sine is 0.835 mm. $3.6 + .835 = 4.435$ mm.

With an index of refraction of 1.3365 the second focal distance of the anterior surface of the normal cornea is 31.095 mm. The angle whose sine is 4 mm. and whose cosine is 31.095—4.435 mm. (or 26.660) is $8^{\circ} 32'$, which gives us the course of the ray parallel to the principal axis, that is just able to clear the pupillary margin of the iris. We now need to know the point on the corneal surface which this ray must intersect. This point is found as follows:

Knowing the angle $8^{\circ} 32'$ and the side BC, we may regard the latter as the hypotenuse and find the line AB by the formula, $c = \frac{a \sin O}{r}$, in which a equals the line BC, c equal the line AB and C equals angle $8^{\circ} 32'$. Applying logarithms this formula reads: $\text{Log. } a + \text{Log. sine of } C - 10 = \text{Log. } c$.

$$\begin{array}{r} \text{Log. } a \text{ (23.266)} \quad 1.366610 \\ \text{Log. sine } C. (8^{\circ} 32') \quad 9.171389 \\ \hline 10.537999 - 10 = 537999 = c = 3.451 \text{ mm.} \end{array}$$

Applying to these quantities the trigonometrical formula, $b = \frac{a \cos. O}{r}$ we find the length of the line AC (b) to be $\text{Log. } a + \text{Log. cos. } C - 10 = \text{Log. } b$.

$$\begin{array}{r} \text{Log. } a \quad 1.366610 \\ \text{Log. cos. } C \quad 9.995146 \\ \hline 11.361756 - 10 = 1.361756 = b = 23.00 \text{ mm.} \end{array}$$

The line AC is found by first computing angle $BC^1 A$ (w) which we find to be $26^{\circ} 9' 30''$, and, applying the same formula as before, we find the cosine of $26^{\circ} 9' 30''$ with radius 7,829 to be 7.027 mm. This last added to the sum 23.00 mm. gives the length of the line CC^1 , 30,027 mm., which is to say at an angle of $8^{\circ} 32'$ from the second focus of the anterior surface of the cornea, in order to clear the pupillary margin, the ray of light must cut the cornea at a point distant from the principal axis equal to the sine of $8^{\circ} 32'$ with a radius of 30.027 mm. This sine is found by the above formula ($\text{Log. } a + \text{Log. sine } C - 10 = \text{Log. } c$) to be 4.455 mm. ($4.455 \times 2 = 8.910$). This is the distance which should separate the stenopeic openings

in order to give two fields whose margins appear exactly tangent with a pupil of 8 mm. With a radius of curvature of the cornea equal to 8 mm. the corresponding result $4.450 \times 2 = 8.90$ mm.; with a corneal radius of 7.5 mm. the corresponding result is $4.53 + 2 = 9.06$; and with the same radius the correction for a 4 mm. pupil is $2.266 \times 2 = 4.532$.

11. A method of calculation which gives nearly the same result is that which is used to calculate the position of the apparent pupil, making use of the general formula—(after Tscherning):

$$\frac{F_1}{f_1} + \frac{F_2}{f_2} = 1, \text{ in which } F_1 = 24, F_2 = 32, f_1 = 3.04, f_2 = 3.6 \text{ and if}$$

$$\frac{1}{0} = \frac{F_2}{I_2}, 0 = 4 \text{ mm. } I_2 = 3.6 - 32 \text{ mm. } = -28.4 \text{ mm.}$$

$$I = \frac{4 \times 32}{28.4} = 4.5 \text{ mm.}$$

Using this formula, the corrections are:

For an 8 mm. pupil 9.01 mm.			
7	"	"	7.88 "
6	"	"	6.76 "
5	"	"	5.6 "
4	"	"	4.507 "
3	"	"	3.3 "
2	"	"	2.2 "

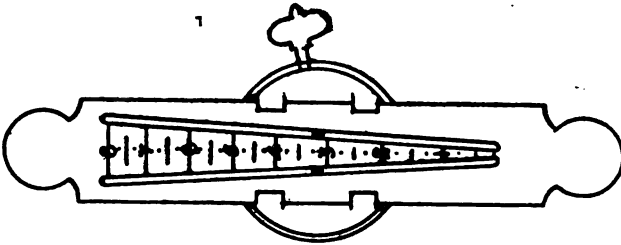
12. Spherical aberration of the cornea may influence the measurement, but inasmuch as the greatest degree of aberration found by Brudzewski was only +4.5D, and because ametropia or accommodation of 5D or less only influences the result in the decimal place, the results would seem sufficiently accurate without correction for spherical aberration of the cornea.

13. The observation that the average excursion of the iris during accommodation is about 0.50 mm. should not be greatly misleading. This amount is, however, subject to more or less correction. The apparent size of the crystalline image of the pupil of course alters with the change of radius of its anterior surface being, according to Tscherning 0.2 mm. larger than the real pupil in the eye at rest. The error from this source does not require a correction greater than the second decimal place. It makes the apparent excursion of the iris in accommodation measure greater than the real excursion.

14. When the pupil exceeds 7 mm. account may be taken

of the spherical aberration of the crystalline. Stadfeldt has shown that in the vast majority of lenses aberration is slight to a point 3.5 mm. from the axis.

15. These considerations seem to show that absolute accuracy by any such scheme is not attainable. Moreover, diffraction causes the edge of the fields to be anything but sharply defined. Furthermore, the retinal image of the distant fields being real, inverted and sharply defined cannot be made to coincide with the crystalline image of the real pupil, which is virtual, erect, and so far as the rods and cones are concerned, diffuse. Nevertheless the point where it is possible to say the fields do not touch and the point where it is certain they overlap are only about 0.25 mm. apart. The method appears, therefore, sufficiently accurate for clinical use



Author's Koremeter.

16. EXPERIMENT 2. Determine the pair of stenopeic openings whose margins appear to be tangent to each other when the screen is placed before the right eye, the left eye being closed meanwhile. If the left eye be now opened and a moderate amount of light be allowed to enter it, the circles seen with the right eye will appear to draw apart and it will be necessary to select a pair whose margins are nearer together in order that the circles may appear to be tangent. This phenomenon is due to the consensual contraction of the right iris. The contraction will be found to be somewhere about 1 mm. in a normal eye in ordinary diffuse daylight. Upon alternately closing and opening the left eye the excursions of the iris of the right eye may be watched. The contraction or dilatation seems to be greater than is required and a slight adjustment occurs which corresponds exactly in

point of time with the to and fro movement of the iris of the left eye if it is watched by another observer.

17. In order to apply and make practical these observations and calculations, I use an instrument which might appropriately be termed a koremeter. As it is impossible to punch or drill openings in a metal disc so that the distances between them should be exact, use is made of a narrow strip of metal which tapers from ten to one mm. in width, resembling somewhat one of the rules of Young's Optometer. It is easy to graduate to 1-10 mm. Using such a strip of metal across the ordinary stenopeic slit of the test case, with a device to hold it before the center of the slit, one can easily and quickly measure the pupil. As to accuracy, it is possible, even with patients of a very low order of intelligence,

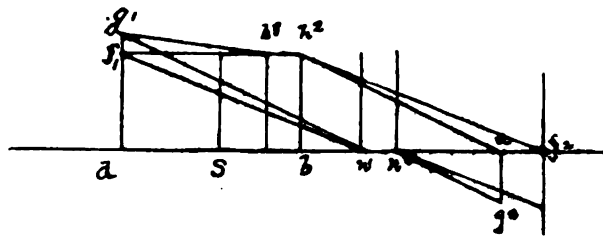


Diagram 5.

to measure the excursion of the iris in contraction to light. Measurement of the excursion with accommodation is more difficult, but averages about 0.5 mm.

18. The corrected scale as computed, according to the foregoing formula, is accurate enough for ordinary purposes. Four millimeters on the scale corresponds to that size of pupil in the emmetropic eye. The actual distance across the metal at that point is 4.44 mm. For 8 mm. the corresponding distance is 8.91.

19. The correction for curvature ametropia is only 0.01 mm. for a pupil of 8 mm. with radius of curvature of 8.00; and 0.09 for 4 mm. pupil, with corneal radius 7.50 mm.

20. As stated in paragraph 10 the diffusion circles in ametropia must be reckoned with. For an example we may take a case of axial hyperopia of 1D. accommodation being sus-

pended by a cycloplegic. Such an eye is according to Landolt's table .314 mm. shorter than an average emmetropic eye. Supposing, for this calculation, that the anterior segment of the eye is normal; the images of the stenopeic openings are formed .314 mm. back of the retina and the cones of rays are truncated by the retina. As the present calculation has to do only with the inner axial margin of the image, diagram 5 may be used to show the size of the diffusion circles. In the conditions presented in diagram 3 the images would overlap if the retina were brought forward. To increase the distance between the openings in the screen in order to decrease the over lap would result in the conditions of diagram 2, in so far as the screen prevented parallel rays from reaching the fovea. If in diagram 2 the retina occupied the plane *c* the images would be tangent. A wider screen is therefore necessary in hyperopia than in emmetropia and the increased distance necessary in the case we are considering may be found by the old problem of similar triangles.

In diagram 5 in which the notation is that commonly used, the triangles $f_2 bh_2$ and $n_1 df_1$ representing the emmetropic eye, are similar because their sides are parallel. Likewise, the triangles abh_2 and $n_1 dg_1$, representing the hyperopic eye, are similar for the same reason. Hence $ab : bh_2 :: n_1 d : dg_1$

$$\frac{bh_2}{ab} = \frac{ab}{n_1 d}$$

and by alternation $bh_2 : dg_1 :: ab : n_1 d$ and dg_1

$$\frac{df_1}{dg_1} = \frac{ab}{n_1 d} = \frac{n_1 d \times df_1}{ab}$$

Now $bh_2 = df_1$, therefore dg_1

No great error will arise if we consider the iris to occupy the second principal plane of the system. $n_1 d$ is equal to the anterior focal distance plus the distance between the first principal plane, and the first nodal point or 20.713 mm. according to Landolt. bh_2 equals 2 mm. ab equals the posterior focal distance minus .314mm. which is the difference in length between the average emmetropic eye and the eye hyperopic 1D. Hence

$$dg_1 = \frac{20.713 \times 2}{20.399} = 2.03$$

so that 1D. of axial hyperopia requires an approximate correction of 0.06 mm. to be added to the correction required in emmetropia with a pupil of 4 mm. It will of course be seen that a ray which has the direction $g_1 h_1$ converges toward the principal axis.

21. In aphakic hyperopia the problem is somewhat different but may be solved in a manner similar to that shown in paragraph 10, remembering that the plane of the iris is farther back. The aphakic correction for a 4 mm. pupil with a corneal radius of 7.829 is 0.68 mm.

22. In comparing the measurements obtained by the millimeter scale with those obtained by the instrument described and figured in paragraph 17, it should be remembered that the former are measurements of the apparent pupil, i. e., the real pupil magnified by the cornea and aqueous, while the latter measurements are of the real pupil without enlargement by the cornea so that a pupil of, say, 6.5 mm. by the scale held in front of the eye will measure about 5.5 mm. by the subjective method.

THE QUESTION OF CYCLOPLEGIA AND OF LATENT HYPERMETROPIA.

BY DAVID DEBECK, Sc. B., M. D.,

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The question of the true refractive error, and the scientific method of ascertaining it; together with the further practical question of the most accurate and practicable method of correcting it, have long been earnestly debated questions. This is true of all forms of refractive error, but especially of the cases of essentially uncomplicated hypermetropia.

There has always been a tendency in some quarters toward efforts to make this work as little time-consuming to the examiner as possible and as little annoying to the patient. To be sure, this tendency carried to the full extreme, would place our work exactly on the same plane as that of the careful optician—but this is no final argument, if there are no other logical objections to this course.

This tendency, which would practically result in "refracting made easy," necessarily consists in advocating as a routine procedure the correction of the *manifest* hypermetropia. This is ascertained without cycloplegia, making use only of the available mechanical optical means, as the various "refractrometers," etc.; and of the methods of "forcing" up the plus glasses tolerated, "fogging" down from stronger glasses than the probable total, etc., etc.

This is occasionally and quite regularly the theme of articles in the journals; and some time prior to my leaving Cincinnati it even formed the main burden of quite a good sized work on Refraction—emanating from one of the New York schools, and palpably showing the influence.

This induced me, at the time, to work over my series of refraction cases (private and clinic) with this point in view. My poor health, however, prevented me from making further use of these statistics at that time. Bringing this, among other material, with me; and noting that it already included

nearly 900 cases, I have held it back until the accessions here made it an even 1000.

The cases are taken in order (working backward through the records); the only selection being that they must conform to the following requirements: They include only the cases from 7 to 30 years of age (inclusive). They must be essentially cases of hypermetropia alone, with the astigmatism insignificant; no cases of 0.50 D. cyl. or more being included, and none of even 0.25 D. cyl., if the H. were 0.75 D. or less. They must have been tested under atropia, with the manifest and total hypermetropia recorded, and the number of the glass prescribed. It is true that such selected cases will not form more than 20 per cent. or 25 per cent. of any refraction series—but they are the very cases upon which these questions hinge.

The cases with astigmatism of any considerable amount are purposely excluded. About a dozen years' careful work with some form of keratometer (either the older model of Javal and Schiötz, or the later American model manufactured by Chambers, Inskip & Co.), has thoroughly convinced me that any one depending upon these practically alone, should have "no standing in court." This, notwithstanding the fact that I use the latter model daily as an instrument of confirmation.

Of course, the cases of myopia hardly come into this controversy. Few care to risk the danger here of over-correction, by dispensing with the cycloplegia, especially as this is of so little annoyance in these cases, that the personal objection has little force.

In Table A the 1000 cases (grouped under ages) are divided into those in which there was no latent H., all this being manifest; and those in which some or all of the H. was latent, and was only revealed under cycloplegia. The percentage of cases showing Hl. is given by years, and again under groups covering half-decades.

This table shows as its most striking feature the large percentage of such cases that reveal latent hypermetropia under atropin. This ranges from over 80 per cent. in the youngest, to but little less than 60 per cent. in the oldest year here included; the entire group showing a little over 70 per cent. This graduation is not uniform, except in a very general way, unless we consider it by groups. In the half-decade groups,

ending at 10, 15, 20, 25 and 30 years of age, we find that the cases with latent trouble form over three-fourths, almost exactly three-fourths, nearly three-fourths, over two-thirds, and but little less than two-thirds respectively. Possibly the proportion could have been lowered (in the earlier series) by time-consuming methods of trying to bring out the Hl.; but as the employment of these in the last 200 cases, or so, did not materially affect the proportion, I am utterly sceptical as to their efficacy.

Table A.—Cases of Hypermetropia.

Ages.	Cases.	Number Without Hl't.	With Hl't.	Per Cent. With Hl't.	Per Cent. by Groups. (Half-decades.)
7	24	4	20	.833	.7703
8	32	8	24	.75	
9	39	8	31	.794	
10	40	11	29	.725	
11	43	10	33	.767	
12	33	9	24	.727	.7506
13	44	11	33	.75	
14	30	7	23	.766	
15	39	9	30	.769	
16	48	10	38	.791	.7456
17	46	14	32	.695	
18	37	9	28	.756	
19	57	14	43	.754	
20	40	11	29	.725	
21	55	15	40	.728	.6923
22	43	14	29	.674	
23	48	15	33	.687	
24	50	16	34	.680	
25	51	16	35	.686	
26	44	15	29	.658	.6218
27	41	15	26	.634	
28	32	12	20	.625	
29	31	12	19	.612	
30	53	22	31	.584	
	1000	287	713	.713	

These 287 cases without Hl. are dropped from further consideration; and the 713 cases with Hl. are considered in Table B. Under each year is given the aggregate of the Hm., the aggregate and the average of the Hl., and the aggregate and the average of the Ht. This Table shows no very striking feature, except the unquestionably large Hl., that runs as an average through all the years. What is unexpected is that it holds practically as large through the early adult years as

through the early school years. We are accustomed to regard these early school years as preeminently those of ciliary tension, those in which we are most likely to meet latent H.; but this table (at least) shows that the active years of early adult life are apparently as likely to show it and to approximately as high a degree. It is only when we compare the ratio of the aggregate Hm. to the aggregate Hl. in two groups covering the two periods, that a distinct difference is noted. From 7 to 22 the aggregate Hm. stands to the aggregate Hl. only as 3:4; from 23 to 30 they are approximately equal; and for the entire period, 7 to 30, they stand about as 4:5.

Ages.	Hm.	Hl.	Ratio.
7-22	338. D.	466. D.	3:4
23-30	196.	213.	2:2
All.	534.	682.	4:5

Table B.—Divisions of Hypermetropia.

Ages.	Cases.	D. of Hm.	D. of Hl.	Average.	D. of Ht.	Average.
7	20	20.50	14.50	.92	39.00	1.96
8	24	20.50	20.75	1.23	50.25	2.00
9	31	28.75	24.00	.78	52.75	1.70
10	20	21.00	28.50	.96	49.50	1.71
11	33	23.25	27.50	.83	50.75	1.53
12	24	12.50	20.25	.84	32.75	1.36
13	33	19.50	28.00	.85	47.50	1.44
14	23	13.00	22.75	.99	35.75	1.55
15	30	15.50	33.00	1.10	48.50	1.62
16	38	29.25	31.50	.83	60.75	1.60
17	32	22.00	34.25	1.13	58.25	1.82
18	28	21.25	31.50	1.12	52.75	1.88
19	43	30.25	42.50	.90	72.75	1.69
20	29	16.50	31.50	1.00	48.00	1.65
21	40	27.00	34.50	.86	61.50	1.54
22	29	18.25	28.00	.96	46.25	1.59
23	33	27.75	27.25	.84	55.00	1.66
24	34	22.25	30.75	.90	53.00	1.56
25	35	35.50	35.75	1.02	71.25	2.03
26	29	26.75	29.50	1.02	56.25	1.94
27	26	20.00	24.50	.96	44.50	1.71
28	20	15.50	15.50	.77	31.00	1.55
29	19	17.50	21.50	1.13	39.00	2.05
30	31	29.75	30.00	.97	59.75	1.93
	713	534.00	682.75	.958	1216.75	1.706

Table C.—Cases of Hl.

	7-10	11-15	16-20	21-25	26-30
.25	17	13	11	14	21
.50	21	35	36	49	25
.75	18	38	46	54	29
1.00	21	17	36	24	16
1.25	8	17	11	9	9
1.50	5	11	14	5	8
1.75	2	8	2	1	2
2.00	5	4	4	7	5
2.25	2	1	2	1	1
2.50	3	2	3	1	3
2.75	—	2	—	1	1
3.00	—	—	2	—	3
3.25	—	—	—	1	—
3.50	—	—	2	1	1
4.00	1	—	—	2	—
4.50	—	—	1	—	—
5.00	1	—	—	1	—
5.50	—	—	—	—	1
	104	143	170	171	125

In Table C the amounts in D. of the Hl. are given, arranged under the same groups of half-decades. This Table shows very little that is striking, except emphasizing again the fact that the Hl. holds practically as high from 21—30 as in the earlier years. In fact, from 16—30 we find more cases of *high* Hl. than we do in the earlier period: while the *very highest* case is found in the very last group: 26—30. This was a male, aged 26, with 1.50 D. Hm. and 7.00 D. Ht. under prolonged cycloplegia. This was one of the earlier cases, and at my last knowledge of him, he had worn + 6.00 D., constant for some years, with great comfort, and marked benefit to V. (which, at the best, was below normal). The two next highest cases (5.00 D.) were also found among the earlier series; both in private. One was in a girl of 8 years, who had 1.00 D. Hm. and 6.00 D. Ht. She wore + 5.00 D. after a little trouble in forcing it on. Two subsequent tests under atropin, made at intervals of 2 years showed a steady decrease of the Ht.; and the glasses worn were each time reduced. This confirms the view, that under relief from the ciliary strain and its accompaniments, the natural processes of growth will round out and deepen such eyes. The other was in a woman of 25 years, with 2.00 D. Hm. and 7.00 D. Ht. She soon wore + 6.50 with comfort and benefit. One subse-

quent test, three or four years later, showed no change; and this tends to confirm the reverse of the view given above. She was not seen again.

Table D.—Selected Maximum Cases.

Ages.	Maxim. Ht. all man't.	^a Maxim. Ht. none man't.	^b Maxim Ht.	^c Maxim. Hl.	Whether c same as a or b.
7	1.50	2.00	6.00	2.25	No.
8	2.00	2.00	6.00	5.00	b.
9	2.50	2.50	7.00	2.50	No.
10	1.50	1.50	5.00	2.50	b.
11	1.50	1.50	4.00	2.50	No.
12	1.25	1.25	3.00	2.00	b.
13	2.50	2.50	2.50	2.50	a and b.
14	1.00	2.00	3.75	2.75	b.
15	1.50	2.25	3.50	2.75	b.
16	1.50	1.25	3.50	2.25	No.
17	2.00	1.50	6.00	3.50	b.
18	1.50	1.50	6.00	4.50	b.
19	2.00	1.50	4.50	3.00	b.
20	1.25	1.25	4.50	3.50	b.
21	3.50	1.50	7.00	4.00	b.
22	2.00	1.25	10.00	3.50	No.
23	1.75	1.00	5.00	3.25	No.
24	2.50	1.25	6.00	2.25	No.
25	1.50	1.25	7.00	5.00	b.
26	4.00	1.25	7.00	5.50	b.
27	4.00	1.25	5.50	3.50	b.
28	1.50	.75	3.50	2.25	b.
29	1.50	1.25	7.00	3.00	b.
30	4.00	1.75	8.00	3.00	No.

We give in Table *D* (more as a matter of curiosity than of real importance) the extreme or maximum cases under each year: the highest example of Ht. in which all the H. was manifest; the highest amount of Ht. with none manifest; the highest individual Ht.; the highest amount of Hl.; and finally whether this highest individual Hl. occurred in one of the other cases or not.

This Table does show a couple of points of interest. It is uniformly noticeable that the cases entirely manifest, and as well the cases entirely latent, are not found among the extreme cases of high H., but among the medium grades: 1.00—2.50. These same two columns show an almost perfect equality up to 15 years of age, with a slight advantage in favor of the latent column; while from that on to 30 years there is a decided advantage in favor of the manifest column. This

shows a slight advantage in favor of the early adult years; and agrees with the same fact noted in Tables *A* and *B*.

Of course these maximum (and therefore exceptional) cases do not show these points so clearly as would a percentage estimate—but the calculation of this would be a labor so great, as not to be thought worth the results.

The conclusions to be drawn from this series, it seems to me, are perfectly obvious.

A.—In nearly three-fourths of all cases of simple H. there is a distinct degree of latent hypermetropia.

B.—This is extremely variable in amount, with no rule for its safe prediction.

C.—In the whole series of cases with Hl. it will average 0.75 to 1.25 D.; an amount *in itself* calling for correction in the vast majority of refraction cases seen.

D.—The plan of correcting the Hm. and, as the Hl. becomes gradually manifest, at intervals changing the correction, is not particularly scientific; and is certainly, in the long run, more time-consuming and annoying than a complete test at once. By this plan one *does* keep in better touch with one's patients, and in the aggregate of the several smaller fees obtained, *does* probably secure a larger average remuneration. This strikes me as the only advantage the plan possesses. It is the optician's gold mine!

E.—The only safe rule, and the only thoroughly scientific plan is to put all these cases under cycloplegia (*and by atropin*), and ascertain accurately the Ht.; possessing which an accurate and scientific correction is possible.

I will not otherwise accept a case under 35 years and with this rule in vogue in my last 2000 refraction cases (all sorts), I have had a satisfaction, and have given a satisfaction, that no previous series has ever afforded.

MYOPIA IN MARKSMEN; A PRELIMINARY STUDY

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About one year ago while attending the rifle matches at Seagirt, N. J., I was attracted by the great number of good rifle-shots who wore glasses, and what seemed to be even more extraordinary the majority of them appeared to be myopic, which after a little investigation proved the case. Proceeding from the knowledge I gained at that time and from further investigation, supplemented by some suggestions and aid I received from rifle shots, and from my own experience, I learned some rather interesting facts. I believe it has always been assumed, and is probably quite true, that the Regular Army qualifications, which include a more or less careful examination of the eye-sight of recruits, are much more rigid than those required of the National Guard.

The reasons for this condition are perfectly obvious when we consider the components of these two branches of the Army, one being composed of men of a variety of ages when enlisting, who are employed in all branches of business, many of them in offices where near work is constantly required, the other practically composed of the pick of young men whose fancy for the sort of work they are about to take up, has more or less previously better qualified them for enlistment. In spite of these conditions, however, the same requirements are made as to qualifications with the rifle or carbine and revolver. In other words, the same amount of skill is demanded of these soldiers of the National Guard as of the Regular Army. It is not the purpose of

this paper to attempt to compare these two branches of the service but to prepare a way for a further investigation of this rather interesting subject. Before going into the subject as carefully as I should like, it will be necessary for the benefit of those who are not familiar with the shooting requirements made by the Army for her men, to give a detailed description of the various classes of rifle shots according to the general orders of the War Department.

Fourth Class. All who have not fired, or who having fired, failed to qualify as Third Class men.

Third Class. All who report for practice and who score 15 out of a possible 50, in two scores of five shots each at 200 yards, and in addition shall score 30 in two scores of five shots each at 300 yards, and two scores of five shots each at 500 yards, and have made a total of 45 out of a possible 150.

Second Class. All who have fired two or more scores at 200, 300, and 500 yards, and from the best two have made a total of 67 out of a possible 150.

First Class. All who have fired two or more full scores at 200, 300 and 500 yards, and from the best two have made a total of 83 out of a possible 150.

All who have fired two or more full scores at 200, 300 and 500 yards, and from the best two have made a total of 83 out of a possible 150.

Marksmen. All who have fired two or more full scores at 200, 300, and 500 yards, and from the best two have made a total of 98 out of a possible 150.

Sharpshooters. All who have fired two or more full scores at 200, 300, 500, and 600 yards, and from the best two in each range have made a total of 160; 120 in marksmen's record course, and 40 at 600 yards; and have fired two or more full scores, timed fire, at 200 yards (30 seconds firing interval in each score), and in the best two have made a total of 25; and have made one skirmish run of 20 shots, advancing from 600 to 200 yards; the total of all scores being not less than 235.

Experts. All who have made the necessary total to qualify as sharpshooter and have fired two or more full scores at 800 and 1,000 yards, and from the best two have made a total of 38 at 800, and 33 at 1,000 yards.

III. Scores shot on the 200, 300, and 500 yard ranges

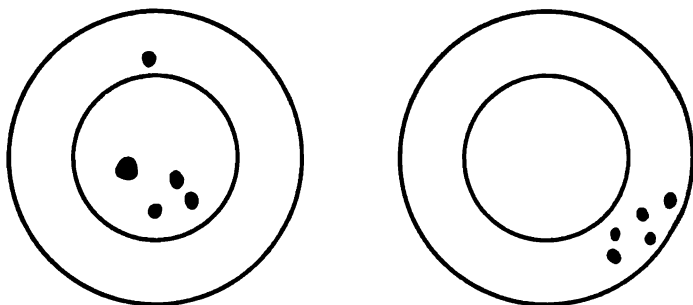
must be signed by a Commissioned or Non-commissioned Officer, who witnessed the score. Scores on the 500, 600, 800, and 1,000 yard ranges must be signed by an Officer who witnessed the shooting, and certifies to correctness of score. Only ink or an indelible pencil will be used in filling up and signing score sheets.

It will be seen that these requirements are not only rigid but embrace a diversity of conditions. Let us consider the ranges of focus involved in these tests. It is a well-known fact among good rifle shots that the most essential points of good shooting, particularly at the longer ranges, are that the front and rear sights be in perfect adjustment for the range and the conditions of weather including light, temperature, wind, etc. I have had the opportunity of studying some cases of myopia, some of them with high grades of astigmatism who are fairly good rifle-shots, and when we compare their scores with what we know of the difficulties it is assumed they have, the results are no less than remarkable. For example, we know that in high grades of myopia there is more or less loss of accommodation depending upon the grade of myopia, and yet these men are obliged to focus three different points at three different ranges, viz; the rear sight, the front sight, and the target. At the risk of tiring the readers of this paper I feel obliged to review what is already familiar to most of those who would be interested in a paper of this sort. In considering myopia particularly as I have in this paper, we know that according to the higher the grade of myopia and the greater the elongation of the axis of the eye the nearer does the far point approach to the eye, and the smaller becomes the range of distinct vision. To the affected individual, the target would appear lighter and of a larger size and blurred with hazy outlines; here also we must consider his familiarity with an object of this sort, unfamiliar objects being practically invisible to him at the same distances. It would be supposed that false estimates of distance and magnitude would be formed and that he would be obliged to create an entirely new range of sight markings on his piece, different from those upon the sight of the piece which has been arranged for the normal, upon the range on which he is firing. Curiously enough, however, this does not appear to be the case, the variance being so slight that it might easily be caused by the difference all pieces of arms of

the same type show by comparison with one another. But the vision of myopes offers other peculiarities, owing to the fact that the eye has a finite far point, so that objects which are more distinct are seen through circles of diffusion which will be all the more annoying because the pupil is generally large. Points of light such as the large targets make, would appear as irregular shining objects, which would appear larger in diameter than they would to the normal eye. These optical defects are partly overcome by the use of the peep-sight and a partial closure of the lids that some men practice in shooting, thus causing a diminution of the circles of diffusion by allowing entrance to the more central rays alone; the pressure of the lids also causing some flattening of the globes. On account of the horizontal position of the palpebral fissure, the diminution of the circles of diffusion is not affected in the vertical direction, thus rendering horizontal lines more plainly visible. The cilia, however, act to some extent as vertical linear objects and give rise to duplication of lines in the same direction. This closure of the lids in shooting is a very common practice.

In speaking of these conditions I have in mind the case of a man 27 years of age who has been in the National Guard for five years, during which time, according to the old qualifications with the Springfield Rifle, he always made a first class marksman's score, which differed from the new qualifications in that first class was only second to the highest possible qualification, which was at that time sharp-shooter. Since the use of the United States Magazine Rifle, following which the new qualifications were prescribed, he has qualified as a marksman. This man's vision without his correction equals $5/100$ each eye and with his correction $6/12$. His correction equals: R. E.—S 8.00 \ominus —C. 3.50 D. ax. 180° . His shooting eye. The other eye, which he does not use in sighting, is slightly less. He has posterior staphylomata and slight chorioidal changes. Another case of interest in this connection is that of a young man 26 years old, who has belonged to the Guard four years, during which time his qualifications have been the same as in the above case. His history follows: Without his correction R.E. vision= $6/35$. L. E. vision= $6/35$; correction = R. E. +8.050 D \ominus c. 3.25 ax. = $20^\circ 6/8$. This man is unable to recognize people in the streets without his glasses, which he never uses when shooting, although he has a

shooting glass especially adjusted, decentered for him. In both cases, they have told me that the target appears to them a black blur against a white background, and in sighting they adjust their sights so that the front and rear sight, when in their proper position, are on a line approximately with the juncture of the black with the white. They can neither of them distinguish the mark. To a good rifle-shot results such as these men get in sighting, would be ridiculous, and yet the man to whom I refer in the second description was at one time a likely candidate for the carbine team of an organization of recognized merit in shooting, of which team of four men all wear glasses and all of them are of the expert class of marksman and have been selected from membership never exceeding sixty-five men. Of this number seldom more than even or eight men try for the team. Two



of these men have a myopic astigmatism of the following degree. The first one = — c. 1.00 D ax. 90° The Second = — S. 0.50 D \subset — c. 0.50 D ax. 10° . One of them wears a tinted glass constant y to relieve a hyper-sensitive retina, the other two have a compound hypermetropic astigmatism of the following degree: R. E. + S. 0.75 D \subset + c. 0.50 D ax. 60° . This man wears a shooting-glass. The other man's correction equals R. E. + S. 0.75 D \subset + c. 0.25 ax. 30° . This man does not use a shooting-glass. As an example of the effect of the shooting-glass upon the vision when sighting, I herewith present the target of a good rifle-shot made at 500 yards. This range is generally conceded to be the easiest as here the prone position is assumed; and, providing the

weather conditions are fair a good shot should be able to place his shots accurately. This man's correction is R. E. + S. 2.50 D \ominus + c. 0.75 D ax. 80° . The lenses are held in large spectacle frames and are decentered carefully for the position assumed in shooting. The following are two targets made on the same range (500 yards) the same day, and under the same general conditions. The spots indicate where the shots struck, the first target being with the glasses and the second without. It will be seen that the shots on the second target are all placed within a space no larger than the bull's eye, showing that the man was holding properly.

This man does not wear his shooting glass. As a fair example of the shooting strength of the National Guard I have the rating of the men of a regiment of infantry and a troop of cavalry. Infantry qualifications for the season 1903. They are as follows:

Experts 12.	Sharpshooters 5.
Marksmen 201.	First class men 126.
Second class men 171.	Third class men 167.
Failed to qualify 70.	Total membership 752.
Figure of merit 57 7/100.	

Troop of Cavalry:

Experts 1.	Sharp shooters 2.
Marksmen 23.	First class men 6.
Second class men 5.	Third class men 5.
Failed to qualify 10.	Total membership 58.
Figure of merit 81.89.	

These qualifications are made under the most diverse conditions, many of the men going to the range but once to qualify, many of them who have just enlisted never having fired a gun before, knowing absolutely nothing about it. In the cavalry troop to which I refer, a little more attention is given to marksmanship, but here also there are many men who fall into the same class as those just described; however, these fewer men can be handled easier.

The following records are the result of questioning and examining the participants in the State Rifle Matches at Mt. Gretna, Pa., and observing as carefully as possible the points

of interest in connection with this match as regards the wearing of glasses. Total number of participants including reserves 93.

Total number of participants wearing glasses 21. Of this number 11 were myopic, 6 hypermetropic, 6 astigmatic above 1 D., 4 of whom had myopic astigmatism; 7 men wear glasses but do not use them when shooting, 4 being myopic, one hypermetropic and the other 2 did not know. Some of these figures must be approximate as some of the results were learned through questioning; the majority, however, are accurate. It is also fair to assume from what these results will show, that, of the total number, there must exist a certain percentage who are sufficiently myopic to ordinarily require the use of a correcting glass, as some of the men represented are of a class not given to much thought of what the value of a correcting glass really is, and who would not consult an ophthalmologist until some very obvious change in their sight was manifested.

In conclusion I beg to acknowledge my indebtedness to corporal G. Betram Regar, Second Troop, Philadelphia City Cavalry, N. G. P., for his valuable assistance in the preparation of this paper.

A CASE OF TRAUMATIC BITEMPORAL HEMIANOPSIA WITH HEMIANOPIC PUPILLARY REACTION.*

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TRANSLATED FROM THE GERMAN

BY DR. WALDEMAR E. FISCHER, ST. LOUIS.

Although the partial decussation of the optic nerve fibers in the chiasm of man can be considered as ultimately proven by means of numerous clinical and pathologic-anatomic observations, particularly by the beautiful experimental and anatomic researches of Prof. Bernheimer, I cannot refrain from offering the following contribution to this subject.

On October 13th, 1903, R. B., a roofer, aged 20 years, was brought to the surgical division of the Ducal hospital in Braunschweig, one hour after he had fallen on the pavement while engaged on the roof of a building 12 meters in height. He sustained the following injuries: Complicated fracture of both forearms, simple fracture of the right thigh, luxation of the right elbow joint and complicated fracture of the right patella. A gaping scalp wound 5 cm. in length over the region of the right temple could be demonstrated; the wound margins and the surrounding areas were contused and suggillated with blood.

Patient was unconscious and bled from the left ear and right nostril. The lids of the right eye as well as the conjunctiva bulbi were suffused with blood. Consequently a fracture of the base of the skull was also present. When the patient regained consciousness on the following day, he complained of severe headache and disturbances of vision. I saw the patient for the first time on June 3, 1904, nearly one-fourth year after his fall, when the above enumerated injuries of the extremities and the scalp wound had healed.

*Klinische Monatsblätter für Augenheilkunde, May, 1904.

The appearance of the man was perfectly good; speech was normal, and memory apparently was intact. Patient states that he can positively recollect having first fallen on his hands, and later striking his head on the pavement. Consciousness he claims to have lost during his transportation to the hospital. Now he only complains, that he sees badly since his fall, but is of the opinion that the visual disturbance which he noticed immediately after regaining consciousness has not changed thus far. In regard to the remaining injuries, patient states that with the exception of a limitation of motility caused by the fractures of his extremities he is absolutely healthy. During the first week after the injury he suffered with polyuria and severe thirst, which has entirely disappeared. An examination of the eyes revealed the following: Externally, on both sides, nothing abnormal is perceptible; there is no ptosis.

Movements of both eyes in all directions are normal; there is no diplopia. An old small macula, demonstrable only by focal illumination, can be found on each cornea. The pupils are of medium, equal width, with good motility and react promptly to light directly as well as consensually. Reaction to convergence is preserved. The ophthalmoscopic examination shows: Clear refracting media, papilla nervi optici appears slightly pale *in toto* in both eyes, the left possibly a little more than the right; outlines of the papillae are distinct retinal vessels are of normal caliber. Central vision with emmetropic refraction is 6/8 in the right eye, 6/10 in the left. Central perception of colors is normal in both eyes. The accommodation is weakened on both sides. With + 2.0 sph the finest print can be read at 25 cm. An examination of the visual fields with a disc 5 mm. square, shows a complete absence of the temporal halves in both eyes, extending to the median line with an omission of the point of fixation for a distance 5° temporally. The nasal halves of the visual fields have an absolutely normal extent for white and colors.

Alternately illuminating the temporal and nasal retinal halves with a strong convex lens, using a concave mirror, or with Kempner v. Fragstein's pupil-refraction tester, revealed: Precise direct and consensual contraction of the pupils by illuminating the temporal retinal

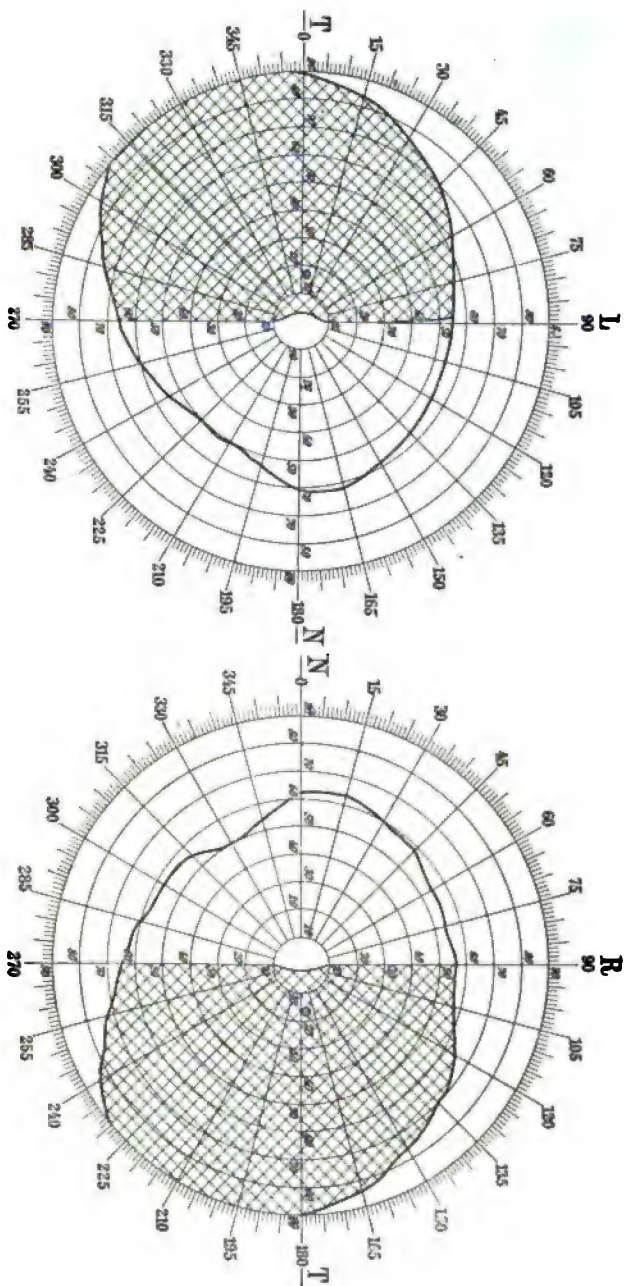


Fig. 1.—Fields of vision in bitemporal hemianopsia (Lange).

halves, a barely noticeably contraction by illuminating the nasal halves.

Colleague Maertens, who was so obliging as to assist me in the execution of Wernicke's symptom, could also absolutely convince himself of its presence.

The sense of smell was absent on the right side, while it was normal on the left, sense of taste intact. An examination of hearing, showed a slight impairment in the left ear, moreover according to assurance of the patient this existed since youth.

The sensibility of the scalp and skin of the face, as also that of the general surface of the body is well preserved; both facial nerves are intact. Internal organs are normal, no disturbance of digestion, urine contains neither albumin nor sugar. Left patellar reflex is more pronounced than the right, which is probably caused by the fracture of the right patella. Right ankle clonus can not be produced. Plantar reflex sluggish. Scrotum reflex present, "Bauchreflex" active, no swaying, no Romberg.

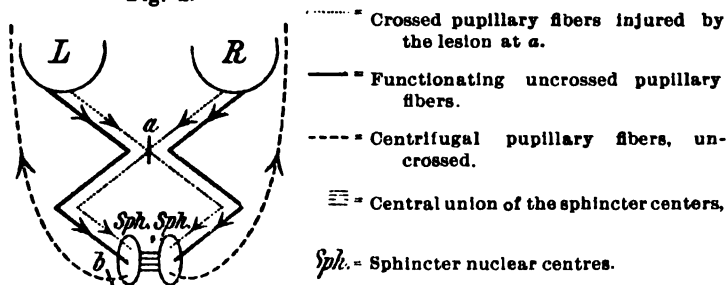
Our case accordingly concerns a bitemporal complete hemianopsia, which could not be more clearly or typically imagined, and only exceptionally presents itself for observation. Seggel in his communication of a cured case of chiasmal affection (Arch. f. Augenheilk. Vol. XL, 1 p. 54) mentions as self-evident that a sharp line of separation of the defect of the visual field as observed more frequently in the homonymous form, cannot exist, as in the various diseases involving the chiasm, the decussating as well as the uncrossed nerve fibers will be injured. "Only by severing the chiasm in a sagittal direction in its center," says Seggel, "as has been observed by Weir Mitchell (as a result of aneurism beneath the lower surface of the chiasm—*Journal of Nervous and Mental Diseases*, January, 1889—will cause a well defined bitemporal hemianopsia with a sharp line of demarcation on both sides; this case will remain an unicum for the present." Other authors express themselves in a similar manner about chiasma involvements, in which primarily tumors and inflammatory processes of the most diverse kinds come in question. On the ground of our clinical experience in chiasma affections, this view is justifiable; but we must relinquish it as we are dealing with a trauma of the chiasm, which might be torn in a sagittal direction

through its middle from its lower surface. The decussating fibers only would be injured while the uncrossed fibers would be wholly spared. The sequel must be a complete bitemporal hemianopsia with a sharp line of separation in the median line, with entirely normal borders for white and colors in the nasal halves of the visual fields, well preserved central vision and hemianopsia, and also consensual pupillary reaction—all of which our patient presented.

Analysing our case more closely:

The diagnosis of a fracture of the base of the skull was confirmed by the hemorrhage from the left ear when the patient was admitted to the hospital and from the right nostril, the suggillation of the conjunctiva bulbi, and the wound in the soft parts of the right forehead. As the

Fig. 2.



patient never complained of visual disturbance before his fall, but as it attracted his attention immediately after regaining consciousness, we can trace it with certainty to the fracture at the base of the skull. It may be positively assumed that the fracture took its commencement at the seat of the wound on the right side of the frontal bone, traversed the roof of the right orbit in a diagonal direction from outward and forward toward inward and backward, passing through the planum sphenoidale on which the chiasm rests with its lower surface, by which it must have been torn in its median line. If the lesion would be more in one than the other side of the chiasm, a defect would be noticeable in the nasal half of the visual field of one or the other eye as a consequence of a simultaneous injury of a portion of the un-

crossed nerve-fibers, which could be excluded by accurate and repeated examinations. The slight uniform paleness of both optic discs must be interpreted as the expression of atrophy of all the crossed nerve fibers which were injured in the chiasm of our case. This corresponds perfectly with Mauthner's assertion, that only fibers of the crossed bundle lie on the surface of the optic papilla which lies in contact with the vitreous body, and that in complete bitemporal hemianopsia, both papillae must appear atrophic in toto (*Gehirn und Auge*. p. 401 u 2). The fissure will have found its termination at the posterior margin of the sella Tursica, otherwise it would have involved some of the ocular nerves distributed at the base of the skull, which would have manifested itself by a paralysis of the corresponding ocular muscle. Injuries to the facial or trigeminus nerves could be excluded as mentioned above.

The paresis of accommodation might be independent of the fracture of the base of the skull, as such, as the remainder of the oculomotor nerve was found intact; possibly it was the result of a circumscribed hemorrhage into the most anterior portion of the floor of the fourth ventricle, consequently it may be considered a pure nuclear paresis. The polyuria which existed in our case during the first weeks after the accident, a manifestation that is known to occur in chiasma injuries remarkably often, is thus far not sufficiently clear.

If we attempt to explain the direct as well as the consensual pupillary reaction in the present case in a scheme showing the distribution of the centripetal and centrifugal pupillary nerve fibers, we are of necessity led to the assumption of a central connection between the two sphincter nuclei, as Bernheimer (*Graefe's Arch.*, IV, XLVII, 1, p. 45) has proven by sagittal sections through the chiasm of apes. In consequence of the solution in continuity of the crossed optic and pupillary nerve-fibers in the median line of the chiasm, and the resultant inability to functionate therefrom in their further course of distribution, in our case only the uncrossed pupillary nerve fibers deserve consideration. As Bernheimer has shown anatomically, these interlace with the uncrossed fibers before the entrance of the tract-fibers in the corpus geniculatum externum in order in the form of fan-shaped fibrillae to enter the substance of the anterior corpora quadrigemina and from here pass forward and down-

ward until they lie under the niveau of the aqueduct to terminate in the region of the small celled paired sphincter nuclei. The centrifugal pupillary fibers of the oculomotor nerve are distributed, as is generally accepted as certain, uncrossed to the eye of the same side. There could hence (see scheme) be only a direct, but a consensual pupillary contraction could never occur by illuminating the seeing retinal halves; if no central connection existed between the sphincter nuclei. Only by the assumption of a central connection of both sphincter nuclei can this phenomenon be accounted for. The scheme for the innervation of the pupil given by Bach (*Graefe's Arch.*, Bd. XL 3, Tf. XI) is not acceptable for us, as the consensual but not the direct pupillary contraction might have been elicited according to it. The assertion advanced by Bach (*l. c.* p. 432) that by the occurrence of the unilateral Argyll Robertson phenomenon, the observation on apes by Bernheimer, and on man by us, of a central connection between the sphincter nuclei is contradicted, I wish to oppose in that, in accordance to our scheme, a circumscribed lesion of the centrifugal pupillary fibers, leaving the sphincter nucleus before their union with the fibers from the other nuclei of the oculomotor nerve (*f.* scheme *C'*), a unilateral Argyll Robertson phenomenon would be fully explained, despite the central connection of both sphincter nuclei, as has already been advanced by Heddaeus (*Arch.*, *f.* *Augenheilk.* xxvii, p. 2, 8, etc.).

That the hemianopic pupillary reaction was remarkably easy to demonstrate in our case, may be attributed to the circumstance that the nasal halves of the retina were in their entirety insensitive to light. Consequently, a beam of light admitted into the eye, could be limited to the blind portion of the retina with relative ease. At the same time, with the whole nasal half of the retina reactionless, the light-perceiving portion of the retina was absolutely smaller than is the case in only partial hemianopsia in which the rays of light reflected from the blind retinal sectors, find more sensitive elements on the surface of the retina on which they impinge and are thereby enabled to produce a more energetic contraction of the pupil, by which the phenomenon of the hemianopic pupillary reaction must lose in distinctness.

Since the post-mortem examination in our case is missing, absolute proof of the diagnosis: Dislateratio chiasmatis

mediana totalis could not be obtained. But the symptom complex in the same is so clear and positive that the diagnosis might be considered as made certain by it alone.

As a proof of the partial decussation of the optic nerve fibers in the chiasm of man, our case may be placed by the side of the vivisection experiments performed by making sagittal sections in the median line of the cat by Nicati, and on apes by Bernheimer. The animals retained their vision, which necessitates the presence of uncrossed nerve fibers in their chiasm. For cogent reasons the portions of the visual fields in the animals could not be accurately determined. We could ascertain, with absolute certainty, that both nasal halves of the fields, for white as well as for colors, were entirely normal in extent, a sure proof that the nasal half of the retina in the human eye, commencing from the macula lutea is only supplied by the fibers, which cross in the chiasm and the temporal half only by the uncrossed fibers. If both retinal halves were supplied by the crossed as well as by the uncrossed nerve fibers, the light sense of the seeing temporal half would have been reduced, while that of the blind nasal half would have been preserved. This was not the case in our patient. If I illuminated the blind nasal retinal half, the patient stated that he perceived a small diffuse sensation of light, but was unable to locate the source of light, because the faculty of light perception was lost completely in the nasal retinal halves.

The diffuse sensation of light, which he perceived, can be ascribed to a stimulation of the macula and the temporal seeing retinal halves by rays reflected from the nasal halves; on the other hand only normal borders could be demonstrated for the nasal halves, even with markedly diminished illumination.

I do not wish to neglect mentioning that on the 20th of February I presented our patient before the medical society and demonstrated the phenomenon of the hemianopic pupillary reaction with complete success.

Of the observations in the literature on complete bitemporal hemianopsia after fracture of the base of the skull, Schoeler's case 4 (*Beitrag zur Pathologie des Sehnerven und der Netzhaut*, Berlin, Peters, 1884, p. 65) has the greatest semblance to mine. This also concerns a case of complete bitemporal hemianopsia. The cases later reported by Nieden, Perreti,

Vossius and Karnitzky, are less precise, because the hemianopsia was unilateral in four instances, in one case (Peretti) the latter developed in one eye during the course of the affection. In our case, in consideration of its four months' existence, the affection may be considered as stationary. At the end of April the condition was still unchanged.

The well known observation of S. Weir Mitchell cited above, is unfortunately not at my disposal in the original. Haddeaus (*l. c.*, p. 40) states that the reaction of the pupils was normal and this, as he expressly asserts, is all that is mentioned about the condition of the pupils by Weir Mitchell. I wish to assume that the author has not undertaken to examine for the eventual presence of a hemianopic pupillary reaction and that his statement refers to the result of the central illumination of the retina, which as mentioned above, also showed normal conditions in my case.

ABSTRACTS FROM ANGLO-AMERICAN OPHTHALMIC
LITERATURE.

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Atropin Versus Eserin in Glaucoma.

SEARLES, W. H., Oshkosh, Wisconsin, (*The American Journal of Ophthalmology*, August, 1904), in a second paper on this subject attempts to show that atropin is anti-glaucomatous regardless of its mydriatic effect. He prefers atropin to eserin and states that its advantage lies in its mydriasis, because in complete dilatation it removes for the time being, one side of the iris angle as completely as the best possible iridectomy, and better still, it does it throughout the entire circle.

Appearances Simulating Optic Neuritis Due to Unsuspected Irregular Corneal Astigmatia.

BURNETT, S. M., Washington, D. C., (*The American*

Journal of Ophthalmology, August 1904), gives an account of a case of this character occurring in a young woman, aged 24 years. She had previously been under the care of another ophthalmologist for many months for what was diagnosed as "optic neuritis" of the left eye, which had been first noticed after a very severe illness, during which there had been much violent vomiting. It was on recovery from this illness, she claims, that she noticed for the first time a loss of visual acuteness in the left eye, with a horizontal streakiness of letters. There was at no time any considerable pain or redness of the eye. For this "inflammation of the optic nerve" she was treated vigorously over a prolonged period, with no perceptible effect, vision remaining stationary. The media of the affected eye were clear but marked blurring of the retinal vessels near the upper and inner edge of the disc was detected. The edge of the disc elsewhere was well defined. Vision in the left eye was 5/15 with a general haziness and horizontal streakiness across all the letters of the test types. The vision of the right eye was 5/5. During this and subsequent ophthalmoscopic examinations, certain parallactic movements of the vessels were noticed which aroused the suspicion that the phenomena might be due to irregular refraction. Examination by the ophthalmometer, however, at once revealed the true character of the trouble. A systematic measurement of the corneal curve was then made by this author's method. No spherical or cylindrical lenses gave any material improvement of vision or relief from "streakiness" of the letters. With a stenopeic hole, however, her vision rose at once to 5/6 and all the blurring and streaks across the letters disappeared. With a stenoptic slit, vision was best when it stood obliquely from above outward, downward and outward, that is corresponding to the meridian of most nearly normal curve, and was 5/6—not quite so good as with the hole. This case differed from cases of keratoconus, in that the defective curvature was limited principally to the nasal and upper quadrant, although the lower nasal quadrant participated somewhat. Burnett believes that in this case the alteration in corneal curvature was congenital and thinks that the lesson to be learned from this case is the necessity of a careful ophthalmometric measurement of the various meridians for at least 10° from the line of the visual axis, whenever, with

perfectly transparent media, there is a diminished visual acuity with the phenomena of "streakiness" or irregular blurring of the test letters that cannot be accounted for by any of the ordinary demonstrable pathologic causes.

S. H. B.

The Size of the Pupil in Iritis.

HERBERT, H., India, (*The Ophthalmoscope*, Sept., 1904), states that his experience in India, regarding the size of the pupil in iritis, is at variance with the usual text-book descriptions. Grouping together primary iritis and iridocyclitis and secondary involvements from severe corneal affections, quite half the cases in Bombay, presumably untreated by mydriatics, show a slight enlargement of the pupil, as compared with that of the unaffected fellow eye, on distant fixation in ordinary daylight. In mild and especially early inflammations, likewise in the hyperemia which accompanies slight corneal lesions, the pupil is usually contracted; and this contraction is at first largely the result of spasm of the sphincter. The small size may persist in later stages with a high grade of inflammation, owing to the anchoring of the pupil by posterior synechiae, and a pin-point contraction may finally result from a shrinkage of the pupillary membrane. Chiefly in severe attacks, but also in some quite mild inflammations, especially such as have lasted for a few weeks, paresis of the sphincter may be responsible for a slight enlargement of the pupil. *Plus* tension, where present must tend also to dilate the pupil, but the enlargement still remains only very slight. Congestion and infiltration of the iris insure this. An earlier contracted state of the pupil is not infrequently outlined in these cases by a ring of pigment deposited on the lens-capsule. That the dilation of the pupil is not an effect of previous mydriatic treatment may be inferred—quite apart from the patient's statements—from the uniformly low degree of the alteration in size, from the absence of marked irregularity in outline of the pupil, and often from the prompt response to the instillation of atropin in the hospital. In India the effects of severe iritis are much more frequently seen than in England. This is largely owing to the cases often remaining for long practically untreated, or to the eyes being simply irritated by native quack treatment. There are also many severe inflammations secondary

to *ulcus serpens* and other grave infections of the cornea. The high average grade of inflammation appears to be responsible for the considerable proportion of cases showing an increase of ocular tension.

Bilateral Glioma of the Retina and Multiple Gliomata(?) of the Scalp.

CAUTLEY, E. London, (*The Ophthalmoscope*, Sept., 1904), records a case of bilateral glioma of the retina occurring in a girl, two years old, associated with multiple swellings of the scalp, said to have existed but one week before coming under the observation of this writer. The affected eye had been enucleated for glioma, which diagnosis was subsequently confirmed by pathologic examination. The swellings of the scalp, alone were present when the case was seen by Cautley who considered them to be secondary growths. The left eye became involved subsequently and more swellings appeared on the scalp. None of these enlargements were subjected to microscopic examination.

S. H. B.

The Subconjunctival Injection of Cocain in Cataract and Other Operations.

KOLLER, CARL., New York, (*The Ophthalmoscope*, Sept. 1904), discards the method of instillation of cocain for the production of local anesthesia when operations on the deeper structures were intended, giving preference to subconjunctival injection. He first instils a few drops of cocain in the conjunctival sac. After waiting one to two minutes he injects with a fine needle 2 to 3 drops of a 5 per cent. solution under the ocular conjunctiva, at a point where he intends to apply the fixation forceps—that is to say just opposite to the place where the section is intended to be made. One must be careful to inject under the conjunctiva proper and not into the episclera, otherwise the resulting edema-like infiltration will reach the place where one wishes to operate and thereby make the performance of corneal or scleral section difficult. It will occasionally happen that a small subconjunctival hemorrhage will result, but that is of no importance. An interval of 5 or 6 minutes should be allowed during which the eye is covered with a wet pad. Dilatation of the pupil will indicate that the drug has penetrated the iris. Any operation performed at this time is entirely devoid of

pain. When forced to operate on cases of glaucoma or inflamed eyes, he uses a general anesthetic. But when operating on an eye not inflamed at the time of operation he employs a mixture of cocain and pilocarpin for instillation and subsequent subconjunctival injection. He has used this procedure almost ever since cocain was brought into use and has been thoroughly satisfied with it. S. H. B.

The Operative Treatment of Entropion and Trichiasis.

BARRETT, W. and ORR, W. F., Melbourne, Australia, (*The Ophthalmoscope*, Sept., 1904), state that the various principles which seem to underlie the successful operative treatment of these troublesome conditions fall under three heads:—(1) measures which have for their object the rectification of the curve of the tarsus, where that exists; (2) measures which have for their object the rotation outward of the skin carrying the cilia; and (3) measures which have for their object the displacement upward on the tarsus in the case of the upper lid and downward, in the case of the lower lid, of the skin carrying the cilia. These requirements can, at will, be effected and relatively modified in the following proceeding:—*Stage 1*.—An incision is made through the skin of the eyelid just above the cilia from end to end, care being taken that it is sufficiently long. The cut is carried down to the tarsus, and the skin, subcutaneous tissue, and orbicularis muscle are dissected upward toward the upper border of the tarsus. Gut sutures are now passed through the edge of the skin adjoining the cilia, and are secured to the tarsus in its upper portion. They usually employ three sutures, one in the middle and one toward either extremity of the incision; these are securely tied and the cilia are consequently everted. The edges of the skin incision are sutured with horse-hair, so that the gut-sutures are to a great extent buried. This is, in effect, a slight variation of the method of Anagnostakis and Hotz. When the tarsus has been very much incurved, they have occasionally during this stage of the operation removed a V-shaped strip of it, or performed linear scarification, or have broken it through with the knife or galvanocautery, preference being given to the knife. *Stage 2*:—In this stage, an intermarginal incision is made from the puncture to the outer canthus, the incision passing up into the substance of the

lid behind the roots of the cilia, which are all included in the anterior flap. This incision is carried up to varying distances, according to the requirements of the case, but it is always thorough and complete. There is no doubt that this incision joins that made in the first stage in many places but bridges are probably left here and there. The immediate effect of this incision is to increase the rotation which has already been produced and to permit a certain amount of sliding up of the skin carrying the cilia on the tarsus. It will be seen, therefore, that in this stage, the sliding principle adopted by Oettinger and others has been utilized. *Stage 3*:—This stage represents Orr's suggestion which has been of signal service;—The posterior flap containing the tarsus is sutured to the lower lid by gut sutures, so that not only are the cilia displaced upward, but the tarsus for the time being is displaced downward. The case is dressed in the ordinary way and the patient is put to bed for several days. The gut sutures tying the tarsus to the lower lid are removed in two, three, or four days; the horse-hair sutures joining the edges of the skin, a little later; whilst the gut sutures uniting the ciliary border to the tarsus are either allowed to stay in altogether or are removed when they become loose. The results of this operation are extremely gratifying.

S. H. B.

Opaque Nerve-Fibres Extending Over a Large Area of the Fundus, Including the Macula.

HAWTHORNE, C. O., London. (*The Ophthalmoscope*, Sept., 1904), relates an unusual case of opaque nerve-fibres in the fundus oculi. The opaque nerve-fibres were not restricted to one or more isolated patches on the disc circumference, but on the contrary completely encircled the disc. Further, instead, as is usual, of extending over the fundus from the disc margin for a short distance only (a disc's breadth or less), the opaque fibres here thrust themselves over so large an area that they formed by far the most conspicuous feature in the ophthalmoscopic picture. Especially, was this unusual extension pronounced to the outer side of the disk. So extreme was the development in this direction that opaque fibres were continued over and concealed the side of the macula and a considerable portion of the fundus beyond this. It was of interest to observe that in spite of this highly exag-

gerated provision of a medullated sheath to the nerve-fibres of the retina, the disc itself, except for a small part of the lower and outer quadrant was not involved in the process. Another detail worthy of remark was the absence from the opaque area in the macula region of the fibrillated lustrous appearance which is characteristic of the familiar small patches attached to the disc margin.

In this same paper, the observer gives an account of another interesting case of opaque nerve-fibres in the fundus in which the peculiarity was the existence of two groups of nerve-fibres, not attached, as is usual, to the margin of the disc, but separated from this by a clear interval of normal fundus. The patient was a youth of very fair complexion and reddish hair; his vision was normal, and neither in eyes nor in any other part of his body was there any other structural abnormality.

S. H. B.

Microphthalmos with Large Orbital Cysts.

DYSON, J. E., India. (*The Ophthalmoscope*, Aug., 1904), describes a case of microphthalmos with large orbital cysts, the subject of which was a Hindoo infant, aged four months. The eyelids and conjunctival sacs were rudimentary. No vestige of an eyeball could be detected in the diminutive sockets. Immediately below each conjunctival sac lay a round, prominent purplish swelling, covered by thin skin. The swelling was soft and pulpy to the touch. The outline of the lower orbital arch could be distinctly felt low down in the cheek below the orbital cyst. An illustration accompanies the description.

S. H. B.

Epidermolysis Bullosa with Ocular Involvement.

PERNET, G., London, (*The Ophthalmoscope*, Aug., 1904), gives an account of this rare condition of the skin occurring in a boy, aged 15 years, which extended to the eyes. The cutaneous condition had existed since birth and manifested itself by an eruption of bullae containing clear or hemorrhagic fluid, on the hands and feet, elbows and knees, and the front of the legs. The bullae resulted not only from injuries of a more or less trivial nature, but also occurred spontaneously. The nails, both of the fingers and toes were absent. The teeth although somewhat irregular were good. The eruption involved the mucous membrane

of the lips. In the right eye the cornea was clear in the center, periphery hazy. The haze is superficial beneath the epithelium. In the left eye, the whole cornea was hazy, but the center less so than the periphery. Three large superficial vessels ran over to the cornea and could be easily moved over the latter. These vessels were not derived from the anterior conjunctival vessels. The superficial parts of the cornea with these vessels, slide over the underlying deeper layer. It will thus be seen that the condition of the cornea was analogous to that of the skin, inasmuch as the superficial or conjunctival layer of that structure separated, belt-like, from the deeper substantia propria. The eyes were stated to have become affected three months after birth. This was the only case of the kind in the patient's family. S. H. B.

Fatal Case of Diphtheria of the Conjunctiva.

STEPHENSON, S., (*The Ophthalmoscope*, Aug., 1904), cites a case of this character occurring in a nine-months-old infant. The patient was in a wasted and neglected state when brought under the observation of this writer for treatment of her eyes, which were red and running with mucus. Four days later the eyelids were so much distended that when they were drawn apart for purposes of examination, thin, watery pus spurted out for some distance. After the eyes had been cleaned, what are described in the notes as "thin flakes of inspissated pus," separated from the palpebral conjunctiva. Protargol (50 per cent.) was applied and a lotion and ointment of boric acid employed. On the following day a note was made to the effect that "There was some bleeding when the membrane was removed from the eyelids. The next day, on admission to the hospital, the child was pale and collapsed; temperature 96.4° F.; pulse feeble, and respirations slow. The eyelids were swollen and "stuck down" with discharge; membrane in both eyes. Discharge from the nose, sores on the nose, sores on the ears and buttocks, and diarrhea were present. The temperature rose on the evening of the same day to 102° F. The condition was much the same on the following day. There was no membrane on the fauces, but at the tip of her tongue was a curious-looking circular ulceration, coated with a thin, membranous deposit. No membrane could be seen in the nose. There was definite cutaneous diphtheria of the lower eyelid

and inner canthus of the left eye. The upper eyelids were hot, markedly swollen, and of a violaceous color, and owing to their board-like consistence could not be fully everted. The palpebral conjunctiva was covered with an ashen-gray membrane which could be detached only with considerable difficulty, leaving exposed a bloodless and waxy-looking conjunctiva. The corneae were clear although there was some bulbar chemosis. The preauricular and the submental glands were readily palpable. A diagnosis of diphtheria of the conjunctiva in a syphilitic subject was made and 6000 units of antitoxin were injected beneath the skin of the flanks. The baby died on the following day, the eighth day of the disease, the temperature falling to 98° F., two hours before death. Bacteriologic examination of the membrane confirmed the diagnosis. In remarking on this case, Stephenson notes that the condition is far from rare in London; its percentage of all conjunctival inflammation being 1:26. It occurred with greatest frequency in those months when ordinary diphtheria was most rife in the metropolis. Constitutional symptoms were present in most of the cases previously recorded. The temperature was slightly reduced rather than elevated. Most of the cases existed uncombined with other forms of the disease. The pre-auricular and angular glands of the same side were enlarged, as a rule, only in severe cases. The cornea was merely hazy or actually ulcerated in 30.23 per cent. of the total number of cases. In the entire 43 cases studied by this observer in 1902, the Klebs-Löffler bacillus was found in every instance; the infection was pure 13.95 per cent. and mixed in no fewer than 86.04 per cent. He also refers to the other recorded fatal cases of this character occurring in England. In conclusion, he states that this patient appears to have died from toxemia induced by the conjunctival diphtheria alone, inasmuch as no membrane could be found in the nose, mouth, or fauces. This point is of importance, since every other fatal case reported, has suffered from a complicating diphtheria of the nose or fauces.

S. H. B.

Melanotic Sarcoma of the Conjunctiva.

DOYNE, R. W., (*The Ophthalmoscope*, July, 1904), reports two cases of this very unusual condition. The microscope was employed to confirm the diagnosis in both instances. The

peculiarity of the condition consisted in the fact that there was in each case a large area of pigmented conjunctiva quite unconnected with the actual pigmented growth: in the first case the growth was at the inner canthus, while the pigmented conjunctiva occupied a broad area on the so-called tarsal cartilage of the upper lid; in the second case the growth was near the margin of the upper lid and the pigmented area was on the conjunctiva of the lower lid. A further remarkable peculiarity was that in the first case, after free removal of the growth, and some of the subsequent recurrent growth, the pigmentation of the conjunctiva, within nine months, entirely disappeared of its own accord. Moreover, the situation where it had been present was never subsequently attacked, although twenty-five recurrences affecting other parts of the conjunctiva were excised during 3 1/2 years, after which time local recurrences ceased. The clinical history together with the pathologic report of each case is given in detail.

S. H. B.

The Deterioration of Vision During School Life.

SAYER, E., London, (*American Journal of Ophthalmology*, July, 1904), in a paper read before the International Congress of School Hygiene at Nuremberg, 1904, gives a detailed account of a series of investigations concerning the ocular condition of London school children. For purposes of study the children were arranged in three departments: 1. Boys, between 8 and 14 years of age; 2. Girls, between 8 and 14 years of age; 3. Infants, between 4 and 8 years of both sexes. The work was carried out on purely scientific principles. A child was taken to have normal vision who distinguished objects subtending an angle of one minute, this being determined by the ability to recognize letters 9 mm. square from a distance of six meters. Only children in the boys' and girls' departments were to be included in the test, and it may be briefly stated that 10 per cent. of the boys and 11 per cent. of girls on an average throughout school life were found to have such serious defects of vision that their visual acuity was 6/18 or worse. In addition, the visual acuity of 1,864 infants, between 6 and 8 years old, 100 of each sex for every three months' increase of age, was very carefully tested. With children younger than this it was impossible to get trustworthy results. As a large number of these infants did

not yet know their letters, the letter E was made in various sizes and positions to correspond with the Snellen's test types, 6/6, 6/24, etc. The infant was placed six meters away, given a large E, to hold, and told to turn it in the same direction as the one indicated—upward, downward, backward, or forward—and rewarded with a sweet every time it got it the right way upon the first trial. The results were very surprising, for it was found that at exactly six years of age 81 per cent. could read 6/6 with each eye separately and only 3.5 per cent. had such serious defects that they could only see 6/18. The defects, however, steadily increased with every quarter of a year of age, until at 8 years old, only 77 per cent. could see 6/6 with each eye, while 8 per cent. had serious defects. By reason of these results, a large number were submitted to re-examination by the ordinary methods. It was now found that when tested with the ordinary Snellen's test types, a much larger number apparently had bad vision, but by this method of E, the vision of infants was, as is stated above. As a reason for this difference, this author endeavors to prove that the higher brain-centers are as yet undeveloped, and that the methods hitherto employed for testing the eyesight of very young children have been at fault. Defective visual acuity, in short, has been confused with want of perception by the brain, and the serious defects among children aged 6 years are only 3 per cent., a percentage which steadily increases until at 11 years old it reaches 11 per cent., and then gets somewhat better again. The observer also enters into a lengthy discussion regarding the normal changes in the eye from birth to old age, the changes during life in the visual centers of the brain, the cause of the rapid deterioration of vision during school life and the indications for treatment. It is advised that all eyes should be tested immediately on the child beginning its education: 1. As to visual acuity; 2. As to rapidity of perception; 3. As to color blindness. Children with subnormal vision should be examined under atropin and if excessive hypermetropia is present, simple plus lenses should be ordered. If there is commencing myopia, the near work should be ordered reduced to a minimum. It is questionable whether the child should be allowed to continue its studies at all. Children with errors of refraction always get as near the work as possible. Spectacles and the use of a face rest which will

keep the face at least 10 inches from the book will overcome this. Color sense is as often untrained as absent, therefore attemptss should be made to develop it. Reference is made to Kerr's statement that pens, pencils, paper, etc., are utterly out of place in an infants' school. They are much too minute. Infants should only be allowed to chalk on cardboard and reading should be learned from the blackboard. Every child in a 6-year-old class should be able to print its name in 6-inch letters on a blackboard with a free arm. S. H. B.

Modification of Anterior Chamber Irrigator.

LIPPINCOTT, J. A., Pittsburg. (*American Journal of Ophthalmology*, July, 1904), describes a modification of his original irrigating apparatus, consisting in addition of a convenient and effective shut-off designed to prevent the backward flow which may occur if the reservoir is allowed to drop lower than the pipe. Reversal of the current would expose the interior of the rubber tube to the risk of contamination and thus neccessitate re-boiling in case one or more operations remained to be done at the same sitting. If the shut-off be used before lowering the reservoir, backward flow is prevented and immediate re-boiling is not neccessary. If care be taken to run all the fluid off before lowering the reservoir, the shut-off is not required, in which case it may be left lying back against the handle. The irrigator in its new form has a larger tip, permitting of a more generous stream than as formerly made, and the general finish is superior. In other respects it is unchanged. S. H. B.

Pemphigus (?) of the Respiratory Tract With Conjunctival Lesions.

JOHNSTON, R. H., Baltimore, (*Journal of Eye, Ear and Throat Diseases*, Vol. IX., No. 3, 1904), relates the clinical history of a peculiar case of cicatrical contractions of the mucous membrane of the eye and throat which seemed to have no relationship to syphilis or traumatism. At the time of recording the case, the patient, a female, was fifty-seven years of age. She had enjoyed remarkably good health until four years previous, when she experienced a severe nervous shock. Shortly afterward she began to have an uneasy feeling in the left eye. At that time she had no throat symptoms. A most careful inquiry failed to elicit any information

regarding remote or recent syphilitic infection. At the time of writing, this case had been under observation for seven months. When first seen, there was a symblepharon between the lower lid and the eyeball. The cornea was clear; the conjunctiva appeared dry; and the lens was cataractous. The anterior nares were somewhat contracted, but not enough to cause obstruction to breathing. On the soft palate, pharynx and epiglottis were peculiar whitish or yellowish patches, round or oval in shape and of various sizes. The probe could be carried under the patches and the membrane could be easily lifted. The soft palate was adherent to the pharynx on both sides, leaving an opening into the nasopharynx about the size of a quarter-dollar. The epiglottis was deformed and twisted to the left. The arytenoids were partly adherent to each other, as were also the vocal cords. There was a small opening into the larynx. As the diagnosis was not at all clear, the patient was given mercury and potassium iodid in increasing doses. The treatment was continued for three months with no improvement. The lesions in the throat disappeared gradually, leaving superficial cicatrices, and their places were taken by others of the same character. At each visit a careful search was made for the blebs but none could be seen. At the end of three months, the specific treatment was discontinued and Fowler's solution was given. Under this drug, the throat has improved—the eye has gone from bad to worse. The conjunctiva has disappeared entirely, and its place has been taken by a hard, leathery tissue which is absolutely dry. The cornea is cloudy, and on its lower part is a beginning ulceration. The lesions in the throat are not so numerous as formerly and the physical condition has improved slightly. Cultures from the patches were made several times, and in each case, a diplococcus was detected which seemed to be identical with the diplococcus isolated by Demime from acute pemphigus, and by Daehnhardt in the chronic form. The coccus usually occurs in pairs and stains by Gram's method. On slant agar, the growth is thick and white with a shining appearance; stab cultures spread over the top of agar, assuming a roseate shape. Gelatin is slightly liquified. On potato, a white film forms. Milk is curdled. Bouillon is rendered turbid. Injected into guinea pigs and mice, the microorganism causes death in four to eight days. Fine hemorrhages are found in the lungs and

cocci can be obtained from the blood. This author concludes his paper with a detailed description of pemphigus when attacking mucuous membranes and refers to a number of previously reported cases. An extensive bibliography is appended.

S. H. B.

New Elevator-Forceps.

GAD, A., Copenhagen, (*Ophthalmic Review*, Aug., 1904), has devised a new instrument consisting of two tiny hand specula, joined together in the form of a common pair of forceps, and bearing on the top of the curvature the forceps-claws. It is used in the following manner: The patient looks downward, the upper lid is lifted and the instrument is introduced with its branches closed as a common speculum; the lid is then drawn upward and, by letting the branches open, one is enabled to catch hold of a fold of conjunctiva alone or together with the tendon of the rectus superior. In this way the fixation of the lid and globe is sufficient for a series of smaller operations and he believes that in many cases this instrument can supplant advantageously the sometimes troublesome stop-speculum (a somewhat similar instrument and one devised for the same purpose—elevating the lid and fixing the globe at the same time—was described by Thomas Nunneley, London Lancet, 1862, p. 271).

S. H. B.

Bilateral Amaurosis Following Severe Hemorrhage After Extraction of a Tooth—Partial Recovery.

STIRLING, S. W., Montreal, (*Ophthalmic Review*, August, 1904), records a case of this character. The patient was an anemic-looking boy, of about six years, and was placed under the observer's professional care by reason of failing vision. By careful inquiry he obtained the following history: Twenty three months previously, a tooth was extracted, which was followed by uncontrollable hemorrhage that lasted three to four days. The patient at the time became almost pulseless and unconscious. On recovery of consciousness the vision was found to be entirely lost, but in the course of two weeks vision returned to a slight degree, since which time there has been very little or no improvement of it. The mother also gave a history of the excessive bleeding about a year or more previously from a slight wound above the left orbit. The child was evidently a bleeder. At the time of the report, the vis-

ion amounted to the perception of fingers at six inches' distance with each eye; there was no appreciation of color; the field was concentrically contracted to within 15° to 20° of the fixation point; and the pupils were 5 mm. in diameter and immobile and barely oscillated to light. Examination of the fundi showed both discs chalk-white, with edges lacking in sharpness, and with a filled-up appearance, rather than the shrunken appearance due to primary atrophy. Some faint white streaks extended along the retinal arteries a short distance from the disc. There were no signs of old retinal hemorrhage. The vessels were only slightly diminished in size, this diminution being mainly in the arteries, the veins appearing of nearly normal size. The appearances were those of partial optic atrophy secondary to an optic neuritis. Further visual improvement was not obtained. The unusual feature of this case is the source of hemorrhage. The cases so far reported have been mostly due to severe intestinal hemorrhage, the next in frequency are uterine hemorrhages and leeching or bleeding, and finally a very few due to nasal hemorrhages, bleeding from wounds, hemoptysis, and urethral hemorrhage. The exact pathology of the visual condition is obscure. The seat of the changes may be in the brain, the optic nerve, or the retina, but the existence of monocular cases favors the possibility of the latter two being the affected area in many instances. In the cases which have been examined microscopically within the first day or two after the hemorrhages, marked changes have been found in the nerve and retina. In mentioning the various causes that are held to be responsible for the ocular condition, the observer refers to Holden's deductions that an edema and degeneration of the ganglion cells of the retina occur first, and later a similar process occurs in the nerve fibers. He considers this hypothesis to be the most simple explanation of the pathologic changes in many of the cases, the slight swelling and later indistinctness of the nerve-head tallying with the idea of an edema. The sudden blindness is due, no doubt, to profound anemia, the intraocular pressure exerted on the greatly lessened resistance of the vessel's walls, especially where they dip over the disc in turning backward, being capable of accentuating the existing intraocular anemia. Venous hemorrhages occur through the degenerated venous walls. Edema and degeneration set in forthwith in the ganglion layer, and it simply depends on the

rapidity of the recovery of the circulation as to how far this degeneration may go on, or how permanent it may be.

S. H. B.

Optic Neuritis Following Smallpox.

FERGUS, A. F., Glasgow (*Ophthalmic Review*, July, 1904), gives the history of a case of unilateral optic neuritis following smallpox in a middle-aged, laboring man. Dimness of vision in the right eye was first noticed by him on leaving the "red room." On examination it was ascertained that the visual acuity of the right eye measured by Snellen's scale was 6/12 of the standard and was not improved by lenses; in the left it was 6/6. Both pupils reacted to light and convergence. Ophthalmoscopic examination showed the media of the right eye to be perfectly transparent and healthy. The optic disc was, however, distinctly blurred, especially to its outer side. There was a distinct hyperemia and loss of transparency in the optic papilla, but there was no swelling of the disc; hemorrhages were not present and there was little tortuosity of the vessels. The blurring was distinct all over the disc, but chiefly at its outer margin. The fundus of the left eye was quite normal; the margins of the disc were distinctly differentiated all around; and there was no haziness. On testing with Bjerrum's light sense types, it was found that when No. iii (the faintest) was used, he could see with the left eye, the fourth row of the letters, but with the right only the first row. The fields of vision, when tested for white light, were both found to be much contracted. At no point did either field extend to a greater angular distance than 30° from the point of fixation. The right was slightly more contracted than the left field. Syphilis was excluded as an etiologic factor. There was no evidence to show that the patient had been the subject of any other form of peripheral neuritis. The natural conclusion, therefore, was that the neuritis was a direct sequel to the infectious fever, smallpox.

S. H. B.

Bilateral Dislocation of the Crystalline Lenses.

WOODRUFF, H. W. (*Ophthalmic Record*, July, 1904), reports the case of a girl, 9 years old, in whom, following the instillation of eserine, the crystalline lens of the right eye disappeared into the vitreous; that of the left eye remained

in position, but the tension became elevated and had to be relieved by a paracentesis. After the effects of the eserine wore off, the lens in the right eye returned to its normal position. Occasionally it would be missing, but most of the time it could be found in the anterior chamber. This observer remarks upon the great rarity of cases of this character.

Triple Rupture of the Chorioid.

LEWIS, J. D. (*Ophthalmic Record*, July, 1904), reports a case of triple rupture of the chorioid, following a severe blow from the fist. There was no discoverable fracture of the orbital bones, the ocular conjunctiva was slightly congested; there were no appreciable notchings at the pupillary margin of the iris; the aqueous, cornea, lens and vitreous were normal. The tension was normal, but there was slight photophobia; no pain. On ophthalmoscopic examination of the eye there were found three very dark hemorrhages (chorioid) with sharp borders—one situated one-quarter disc diameter from the papilla, and two on the temporal half of the fundus; one one-quarter disc diameter from the nerve and the other three and one-half disc diameters from the papilla. Retinal vessels traversing the hemorrhagic areas were not visible. In addition to these hemorrhages, there was a large retinal extravasation upward and slightly inward from the disc, and blood was plainly visible in the macula. Four months following the injury the eye-ground presented a picture of three typical chorioidal ruptures, the margins of which were entirely free from pigment granules. The treatment consisted of rest and atropin instillations. The elements of interest in the case were the clearness of the media; especially the vitreous; a chorioidal rupture situated in the nasal half; a horizontal rupture of the chorioid; absence of pigmentary deposit about the margins of the rupture; the condition of the macula, and the accompanying retinal hemorrhage.

Eyestrain as a Causative Factor in Sinusitis.

PHILLIPS, W. S., Buffalo, N. Y., (*American Medicine*, Sept. 17, 1904), in an extensive bibliographic article on sinusitis, gives the history of frontal sinusitis and its connection with eyestrain. He mentions that patients who suffer from frontal sinusitis complain of frontal headaches, pressure

above the eyes, inability to concentrate thought, occipital headaches, dizziness and nausea, associated with injection of the conjunctiva, defective vision, swelling and redness of the skin over the cavity, edema of the upper lid, with tenderness above and beneath the supraorbital ridge, and also painful sensations in the back part of the eyes. Exophthalmos is a symptom which may lead to error, if too much importance is placed upon it without excluding high degrees of myopia, paralysis of one or more ocular muscles, goiter and tumors of the orbit, which conditions may also cause diplopia.

The writer also mentions the fact that headache is found in about three-fourths of all patients consulting the oculist. He also goes into the details as to diagnostic technic in sinusitis. After excluding all the ordinary causes of sinusitis, he brings forward the claim that there is a certain class of cases that can be directly attributed to eyestrain and adduces the histories of ten cases to prove this argument. In referring to frontal sinusitis caused by eyestrain, he states, we must only consider inflammation of the lining membrane of the sinus that may vary from slight congestion to a purulent condition. The nervous system bears an important part in the production of secretion. The vasomotor nerves distributed to the muscular coats of the arteries control secretion. When these nerves are divided the vessels become dilated and secretion becomes free. If the extremities of the nerve be stimulated, contraction of the vessels follows and the secretion is arrested. To produce clear vision with the astigmatic eye, we must use up all the residual nerve energy, because of the increased work required to focus an eye that has different meridional lengths. This drain of nerve-force robs other parts of the required energy to keep up a normal condition and acts as would a division of the vasomotor nerves, dilating the bloodvessels and increasing the amount of mucus in the frontal sinus. If this secretion is allowed to accumulate from day to day, it will eventually become infected by germs entering into the sinus from the nasal cavity, which may be forced upward by the act of blowing the nose, etc. We find frontal sinusitis following grip and other depleting diseases, cured by removing eyestrain. This at first seems hardly probable and is explained, when we consider that many times people have a great refractive error that

does not produce eyestrain, because of their being in such perfect health, that it easily compensates for the waste of nerve energy; when the vitality of such a person falls below par, it is impossible many times to restore health until the waste of energy is checked. He further states he is unable to say at present what percentage of sinusitis is due to eyestrain and what percentage may be cured by glasses, but it has been his good fortune to relieve all the patients upon whom he tried this treatment. The symptoms that are supposed to be caused by this process, within this cavity, are all due to severe strain upon the nervous system of the eye. This is illustrated by the almost immediate relief obtained by properly correcting glasses, that is with the exception of the pus which slowly grows less and less and eventually ceases. The appended histories show great care in the preparation and study of the cases, illustrating this relation between eyestrain and frontal sinusitis. The article is well worth careful reading and the proposition it contains is entitled to consideration.

S. H. B

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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State of the Fundus in General Paralysis.

KERAVAL AND DANJEAN. (*Archives de Neurologie*, XVII, March, 1904.) The authors studied in the Asylum at Evrard the state of the fundus of the eye in general paralysis. Their studisc included 42 females. In 4 of these they found the eye-ground entirely normal. In 9 others they found the papilla deviating slightly from normal, but hardly with lesions that the authors regarded as unquestionable. It is most probable that these were the ordinary variations from normal that come within the physiological limits.

In 21 they found ophthalmoscopic lesions. In 3 cases the disc borders were indistinct and feathery in one or both eyes. In 7 the discs were softened and obscured. Finally in all there was atrophy of the optic nerve in course of evolution. In 7 other cases the authors describe eye-ground lesions of which some were certainly independent of the paralysis. These were cases of staphyloma posticum, chorioiditis, old chorioido-retinitis, etc They estimate in all that 61 per cent. showed fundus lesions, which they regarded as due to the paralysis.

The cases of the first two groups are very doubtfully pathologic; indistinct disc edges and softened disc surfaces being very uncertain factors, especially as the visual acuity

and the visual fields are not given to aid in solving the question. Even in the group of atrophies the discs are merely mentioned as being blurred and pale, and without references to impaired vision or blindness. In fact, in only one case is there clearly noted a double optic papillitis—undoubtedly a case of neuro-retinitis really due to the paralysis.

Vernal Catarrh—Treatment by Electrolysis.

GALLEMAERTS. (*La Policlinique de Brux.*, Feb., 1904.) He describes three cases. He advises, during the winter when the condition is ameliorated, to be content with employing daily lotions of boric acid, and improving the general health. But during the period of recrudescence he advocates energetic action.

In two cases he used adrenalin, without results, and then had recourse to electrolysis. The patient is anesthetised, the lid is everted with a Pean forceps, and the papillomatous swellings are excised. The electrolysis is practiced by applying the positive pole to the temple and sweeping the copper point which forms the negative pole along the grooves left by the excision of the papillomatous folds. He needed several *seances*. In one case there was a very good result; which has been well maintained for some considerable time. In the other case there was also improvement, but he was not able to follow up this case sufficiently.

Gravity of Syphilis With Ocular Complications.

MOTAIS, Angers. (*Acad. de Med.—Recueil d'Oph.*, June, 1904.) The author holds that the ocular localisations are of very great utility in the diagnosis of syphilis; and also serve in the prognosis of this affection. He says that 82 cases, followed for periods from 2 to 19 years, establish the prognostic value of iritis, chorioido-retinitis, neuritis and optic nerve atrophy.

Notwithstanding an energetic mixed treatment there followed grave tertiary complications in 43 of the 82 cases (52 per cent.). This figure is really below the actuality, as certain cases could not be followed for a sufficiently long time.

The tertiary accidents occurred 10 times in the bones, 8 in the viscera, 12 in the brain, 9 in the cord, and 2 each in the skin and the mucosa.

After iritis the nervous lesions are relatively rare (15 per

cent.) while bone lesions predominate (20 per cent.). After chorioido-retinitis the nervous lesions are frequent (22 per cent.) while the bone lesions reach only 8 per cent. After optic neuritis nervous lesions were almost the only ones observed. In 5 cases the optic neuritis remained the only complication. He concludes that the ocular manifestations of syphilis should always give a grave prognosis; and necessitate an energetic and prolonged anti-specific treatment.

Instrument to Determine Binocular Vision and Visual Acuity.

ARMAIGNAC, Bordeaux. (*Soc. Fran. d'Oph.—Annales d'Ocul.*, June, 1904.) Armaignac has devised a new method of determining the existence of binocular vision, and measuring at the same time the visual acuity of each eye. He has constructed for this purpose a small and very simple apparatus, based on the old method of the ruler or pencil; but giving results much more precise. It is composed of a rectangular box, having one end open and the other end closed. The upper wall has a window, lighting a small card of test-types, placed vertically against the closed end. The floor has a median, antero-posterior slit, in which slides a vertical narrow strip. The open end has a test-frame fixed at 25 or 30 cm. from the test-types. These test-types are composed of nine vertical columns of words which decrease in size from above downward, so that they correspond for this distance of 25 cm. to $1/9$, $1/8$, $1/7$, $1/6$, $1/5$, $1/4$, $1/3$ and $1/2$, respectively of normal visual acuity.

According to the position of the sliding screen strip along the lower groove, there is always one column of words hidden from each eye; but the hidden column of one eye is, of course, always visible to the other eye. The result is that each line can be read *horizontally* in its entirety only when the visual acuity of each eye is not below what is necessary to the reading of this line. If one eye sees better than the other, it continues to read the smaller and smaller words, but omits the words of the column hidden from it by the screen strip, and are seen, to be sure, but no longer read by the more amblyopic eye. The line, at which the reading ceases for one or the other eye, indicates the visual acuity of the corresponding eye.

It is seen at once that the binocular vision may be de-

terminated by the same ability to readily read across any given line.

Notwithstanding the exact results furnished by this apparatus, which even permits the use of the glass required for near vision, if necessary, the author recommends, nevertheless, the use also of test-types, with words colored red and green, and the placing in the frame of a red glass upon one side and a green glass upon the other. By this method one has a control over the other method, and the most exact results are secured.

Vision in Deaf-Mutes.

DESJARDINS, Montreal. (*Soc. Fran. d'Oph.—Annales d'Oculistique*, June, 1904.) According to Dejardins' studies, hypermetropia exists in deaf-mutes in about 80 per cent. of the cases, and amblyopia in 53 per cent. Contrary to the view of Adler, he does not deem it admissible to regard visual acuity and intelligence in these subjects as correlated, or related proportionately; 43 per cent. of the deaf-mutes having an intelligence more or less mediocre, enjoyed normal visual acuity; while 46 per cent. of those with normal intelligence were amblyopic to various degrees.

The fact that he had met, among 145 deaf-mutes, with but a single case, born of first cousins, suffices to prove that one can not consider consanguinity as one of the principal causes of deaf-mutism and its consequences to the eye.

Rare Forms of Sympathetic Ophthalmia.

CHEVALIER, Mans. (*Soc. Fran. d'Oph.—Annales d'Oculistique*, June, 1904.) The forms under which sympathetic ophthalmia presents itself are nearly always the same: irido-chorioiditis serosa or irido-chorioiditis plastica; and the author has not troubled himself to describe these. But there is often too much confusion concerning the rarer manifestations. In truth, all the constituent parts of the eye may be involved at the same time with the development of the chorioiditis serosa or plastica. Still there is reason to establish a group perfectly distinct for the irritative forms—epiphora, variations of visual acuity, troubles of accommodation, etc. What the author has sought to bring out is that there may exist diverse and perfectly distinct clinical forms under which sympathetic ophthalmia may manifest itself.

In 1864 Kleindorf was the first to insist upon sympathetic keratitis and irido-keratitis. Other authors, Galezowski, De Lapersonne, Vignaux and Reclus have reported cases, and the author gives a personal observation. This form seems to be the most frequent of the abnormal manifestations. Then follow in order chorioido-retinitis, sympathetic glaucoma and detachment of the retina. But the latter two forms particularly are very questionable, and further observations are very desirable and necessary. However, Bouchon has reported an excellent, and apparently perfectly trustworthy, observation of sympathetic detachment of the retina.

Ectasia of the Lachrymal Sac.

ROLLET, Lyon. (*Soc. Fran. d'Oph.—Recueil d'Oph.*, June, 1904.) Rollet reports the case of a woman, aet. 67, in whom he had extirpated a voluminous lachrymal sac, filling up all the inner angle of the orbit and pushing forward the greater portion of the lower lid. It resulted from a chronic inflammation, due to pneumococci. In this immense ectasia the tumor comprised one portion extruded outside of the lachrymal fossa, and which had developed mainly upward and forward.

The extirpation, assisted by a preliminary injection of paraffin, was total; and the sac was dissected *en masse* without rupture.

Treatment was by simple dressing, without sutures and without drainage. Healing, with no resulting epiphora, occurred in two weeks.

Internal Incision of Pre-Lachrymal Pockets in Dacryocystitis.

AUGIERAS, Laval. (*Soc. Fran. d'Oph.—Annales d'Ocul.* June, 1904.) Augi  ras has treated two cases of chronic dacryocystitis, with pre-lachrymal pockets, communicating with the sac, by means of an *internal* incision. After cocaineization, with or without incision of the canaliculus according to the case, he forces a Weber knife into the sac, and turns its edge forward. With the finger he presses back the skin of the region until he engages the anterior wall of the sac upon the knife-edge. Then he incises these intervening tissues without cutting through the skin. The procedure is not so difficult as the description might indicate.

In the first case, in which the pre-lachrymal pouch has returned after treatment by external incision, the inferior canaliculus was incised, the nasal duct stricture was cut, and the lachrymal style was kept in about fifteen days. The third day after the incision he practiced electrolysis (negative: 5 milliamp. = 5 minutes) of the lachrymal duct, taking care also to bring the pole in contact with the cavity of the incised pouch. Probing, at intervals, was kept up. The cure was maintained at the end of two years.

In the second case, the pre-lachrymal pocket and the dacryocystitis dated back three months. The internal incision was made in the same manner, but without finding it necessary to incise the canaliculus. No electrolysis was employed in this case. Probing and injections were continued. There was a practical cure in three weeks.

It is suggested to have recourse to this method of internal incision of the cystic pouch in the cases in which the patients hesitate to submit to other and longer methods of treatment.

Abuse of Probing in Simple Dacryocystitis.

BERARD, Angouleme. (*Soc. Fran.d'Oph.—Annales d'Oculistique*, June, 1904.) Probing becomes useless and probably irritating where a No. 3 Bowman probe can be passed, and with this frequently secured at the first sitting. One has not to do often with a narrowed duct which prevents passage of the tears; but with an inflammatory irritation, which by reflex action causes a hypersecretion of tears, which even the normal canal would not permit to pass.

At the time of passing the Bowman probe it is necessary to make only an injection of the canal with sterilized water, or with an antiseptic solution, if the secretion of the sac be mucus.

In the suppurative dacryocystitis or suppuration of the sac, it is not usually possible to carry out at the same sitting this, which, nevertheless, remains the treatment of choice.

An Official Standard of "Blindness."

TRUC, Montpellier. (*Soc. Fran. d'Oph.—Recueil d'Oph.*, May, 1904.) Truc had formerly studied the condition of the blind in France (one of these papers was abstracted in these

ANNALS, October, 1903, p. 681); and reported his conclusions to the French Ophthalmological Society. These conclusions were that with 0.1 V., and upward the subject was at least self-supporting; but that with V. below 0.1 the subject became socially, or economically "blind," being no longer capable of self-support at any occupation. On vote of the Society it was decreed that 0.1 V. should be officially regarded as the lower limit or base line of practical vision; and that V. below this is officially "blind." This decision is of medico-legal importance, for this standard will no doubt become the legal standard—in France at least.

Unification of Test Types.

LANDOLT, SULZER AND VIGNES. (*Soc. Fran. d'Oph.—Annales d'Oculistique*, May, 1904.) The authors, as a Commission, reported the following conclusions to the French Ophthalmological Society; and their Report was adopted as the official expression of the Society.

1. The visual acuity is determined in the *minimum separabile*, that is to say, by the smallest angle under which two points or two lines, black upon a white ground, can still be distinguished as being separated.

2. The thickness of these lines is to be equal to the space which separates them.

3. The visual acuity is determined by the inverse of the angle of the *minimum separabile*, according to the progression indicated below.

4. The unit of the measure of acuity is represented by an angle sufficiently large, in order that the degrees that one ordinarily meets with in practical ophthalmology are expressed in whole numbers.

5. The gradation of the series progresses according to the co-efficient 1.259. This factor is based upon the decrease of the visual acuity from the center to the periphery of the macular region (studied recently with this point in view by Sulzer).

6. Visual acuities inferior to the unit shall be expressed in tenths of the unit.

7. The visual angle unit shall be $1/5$ of grade* = 0.20

*The grade is the unit in the decimal division of the circle. The quadrant is divided into 100 divisions-grades, instead of the present 90.°

gr. = 10' 48". V. = 0.0926 of the present system

8. The optotypes shall be constructed on the plan to best secure the principle of the *minimum separabile*.

9. To denominate the unit of visual acuity, employ the term OPT.

10. The test types thus established, shall be designated the test-types of the French Ophthalmological Society.

The Commission was continued to act with the regular Executive Committee of the Society in presenting and advocating these conclusions at the International Ophthalmological Congress at Lucerne.

Recurrent Cylindroma of the Orbit.

MOISSONNIER, Tours. (*Soc. Fran. d'Oph.—Annales d'Ocul.*, June, 1904.) Moissonnier reports the recurrence of a cylindroma of the lachrymal gland, which he had presented at the meeting of the previous year, 1903. The recurrent growth is found under the orbital arch, and behind the eyeball, which is pushed downward and forward. The tumor is large and roughly T-shaped; the transverse portion spreads out in the everted lid; while the vertical part dips into the orbit and is firmly attached to the bone. One can make out certain spicules or bridges of bone, but the eyeball is still conserved.

Twelve months after the last operation it did not seem as if there was to be any recurrence.

The tumor is formed of cubical epithelial cells, with scanty granular protoplasm, and ovoid nuclei enclosing numerous pigment granules. These are more abundant than in the original tumor, and constitute about two-thirds of the growth. The conjunctival tissue is especially interesting. It forms alveoli of various shapes, and has undergone at points a *hyaline* degeneration, which has developed at some places into spherical masses, and at others into irregular arborescent forms. On the walls of these are arranged the neoplastic cells in a single layer. The central part of the growth is clear, fibrillated and limited by an extremely sharp double-contoured line. One layer of non-degenerated conjunctival tissue envelopes the tumor, which presents on the whole the same histological characters as the original tumor.

Paraffine Cast of the Orbit.

COULOMB, Paris. (*Soc. Fran. d'Oph.—Annales d'Ocul.*, Juñe, 1904.) Coulomb describes and figures an instrument, and explains his method of securing an accurate cast of the orbit after enucleation or evisceration. This may then be employed to aid in selecting or making an artificial eye that shall most perfectly conform to the cavity for which it is intended, a plan that is particularly useful when the artificial eye must be ordered from a distance.

He refers briefly to the method of Domec, of Dijon, who uses a mass of soft paraffine, put in place and moulded by the fingers through the lids. He states the objection to this plan is the difficulty of choosing just the right amount of paraffine in the lump, and the practical impossibility of adding to it after one starts. Consequently the cast may vary considerably in size, and necessarily departs more or less from the true shape.

His instrument consists of the usual syringe, and a detachable ocular tip. This has screwed upon the end a thin, elliptical plate, curved in the general curve of the front of the globe, or of an artificial eye (there may be assorted sizes of these), and with the opening through its center. Above this is another plate curved similarly and fenestrated, and screwing up and down upon the shaft through its center. Above this the syringe is inserted by a rubber connection. The whole apparatus, in principle, is much like a Desmarres lid forceps, except that it clasps both lids at once.

The orbit is strongly cocainized by several applications during ten minutes. After the last application the orbit is gently, but thoroughly dried out, so that there remain no drops of moisture to prevent the paraffine at any point from coming in direct contact with the mucous membrane. The lower plate is inserted beneath the lids, and the upper plate is screwed down upon them. Then the paraffine, at the proper temperature, is injected with as steady and uniform a pressure as possible, until the resistance shows that the cavity is evenly filled. Cold water applications are made, and the cast hardens in 12 or 15 minutes. While *in situ* the position and size of the iris and pupil may be marked upon it. Its employment in choosing or devising an artificial eye, is most satisfactory. This is particularly true in the cases in which the orbits are of abnormal shape or contents.

The patients state that the procedure is not painful. Only in a very nervous patient was there a strong, spasmodic and apparently uncontrollable contraction of the lids during the injection. The cast obtained gave no doubt the proper contour and depth of the culs-de-sac, but did not truly give their width; and would certainly have been insufficient to design an artificial eye at a distance, with this the only aid given.

In those cases of shallowing or obliteration of the culs-de-sac, in which their depth is insufficient to permit applying this instrument, the method of Domec must be the method of choice,

Histological Examination of Old Amputation of Anterior Segment.

TRUC, Montpellier. (*Soc. Fran. d' Oph.—Annales d' Ocul.*, June, 1904.) Truc regards amputation of the anterior segment as an excellent conservative operation, of the same standing as eviseration and cilio-optical neurotomy. It is the operation he usually performs. In malignant growths and sympathetic ophthalmitis he regards enucleation as demanded; but there are many indications for the more conservative operation: staphyloma, buphthalmus, glaucoma absolutum, etc. One may fear theoretically that the cicatricial alterations are susceptible of direct or sympathetic irritation; and that there are not sufficient observed examples where the eventual enucleation of the stump deprived the whole complication of danger. In this sense his case is of interest.

Young man, aet. 24, had five years previously been burned in the left eye by an accident with ammonia. Truc performed amputation of the anterior segment of the eyeball on account of the corneal sclerosis, with persistent pain and complete loss of vision. Five years later a simple myopia of 1.00 D. had developed; with normal vision under correction. Although this was not out of relation with the development of the subject, there being professional overwork and maternal heredity, it was thought possible that sympathetic influences might exist, and the stump was enucleated.

It was very regular, and its volume and macroscopic appearances practically were normal. Histologically the cicatrix presented at its most prominent portion an inclusion of conjunctiva, a small strip of the capsule, and lens debris, but without irritation.

The sclera and chorioid were normal. The optic papilla was somewhat swollen, and surrounded by neuroglial proliferation. The retina was thickened and presented this same proliferation in marked degree both in front and at the back; with some destruction of the cellular and epithelial elements.

In general, as was also shown in the experimental researches of Panas upon the dog, there was no lesion appreciable that would be susceptible of sympathetic irritation. This anatomic fact comes to the support of the innocent character of this operation, and confirms the numerous clinical indications for its use.

Dermatolysis Palpebrale.

TERSON. (*Soc. Fran. d' Oph.—Annales d' Ocul.*, June 1904.) Attention has been called in late years to a special form of pendulous hypertrophy of the skin of the eyelid, which droops apron-like and cuts off the view of the deeper parts. This is the "blepharochalasis," of Fuchs. (Two good illustrations are given by Haab, in his "External Diseases of the Eye.") Clinical observations and histological examinations have been reported; especially in the articles by Lodato. Terson took up the study of the condition, based upon three new cases; and has sought to clear up the dermatologic nature of the lesions. After having considered the analogous cutaneous affections, he examined the relations of blepharochalasis with this dermatolysis; of which the one is not to be regarded as other than a variety of the other. We have not to deal, in the cases which Terson considers, with either a ptosis adiposa or the swelling found in some cases of exophthalmic goitre; but only with this characteristic pathologic relaxation of the skin.

Blepharoplasty by Frontal Flap in Traumatic Coloboma of the Upper Lid.

SUREAU, Paris. (*Soc. Fran. d' Oph.—Annales d' Ocul.*, June, 1904.) Sureau presented a patient in whom, following the kick of a horse, there had developed a vertical irregular cicatrix of the upper left lid. This began about two centimetres above the eyebrow, and passed down through all the constituent layers of the lid, involving even the tarsus. Sutures had been applied at the time of the accident by a physician; but either there had been a loss of substance, or the sutures

had been applied without order or method: for the lid portions and the eyebrow had grown together, except the free border of the lid, and there had resulted an actual coloboma. What might have been expected had occurred. The eye was inflamed, the cornea showed an infectious ulcer, and vision had been reduced to a simple perception of light.

Sureau made a double incision (horizontal and vertical) freeing the lid, followed by a tarsorrhaphy including the two external layers of the free lid borders. The infected ulcer healed in a few weeks. But notwithstanding the plastic operation the closure of the lids was incomplete at the inner canthus, on account of the retractions up and downward of the cicatricial tissue. Sureau refreshed the edges, and took a flap (with pedicle) from the forehead, to fill in the space. In a few days there was union by first intention, and a return of the sensibility of the flap. The movements of opening and closure are now easy and complete. The cornea is almost entirely clear. Vision, from a mere perception of light, has mounted to $\frac{1}{3}$.

Sureau advises the frontal flaps in all those cases of severe and destructive injuries of the upper lids, in which blepharoplasty operations are found indicated.

Burn of the Eye by Sulphuric Acid.

VILLARD, Montpellier, (*Soc. Fran. d' Oph.—Annales d' Ocul.*, June, 1904.) Villard has studied this experimentally in the dog. The process of disintegration from burns by this acid may be divided into four principal stages.

A: Stage of chemical "fixation." In this first stage the lesions are exactly analogous to those caused by the reagents known in histology as "fixing" agents. There is a true "fixation" of the tissues by the sulphuric acid. The epithelium is killed, but conserved in form; it may remain adherent or be detached totally; or in some cases its superficial layer only may be detached. The fixed cells are disintegrated so thoroughly that usually there is hardly any trace left of them. The corneal lamellae are enormously swollen, so that the entire cornea seems thickened. The iris is hyperemic. In the first hours there is an albuminous exudate into the anterior chamber, this later becoming fibrinous. The epithelium of the conjunctiva is mortified in places, and the mucous cells are greatly swollen.

B: Stage of leucocyte reaction. In 36 to 48 hours the whole anterior segment of the eye is invaded by the white cells. These leucocytes, nearly all polynuclear, invade principally the cornea and anterior chamber, where there is formed an abundant hypopyon. This leucocyte infiltration invades also the lids.

C: Stage of ulceration and perforation of the cornea. About seven days after the burn the cornea commences to ulcerate. The ulceration results in a destruction, pure and simple, of the layers affected by the acid. In some cases there is an attempt at repair of the corneal ulcers by epithelium coming in from the limbus; but this reparation is never complete, and the perforation is fatal in all cases in which the eye is seriously injured by the acid. The new-formed epithelium, which tends to re-cover the ulcerated cornea, develops upon its most anterior surface cells which take the character of young cells in process of proliferation; and identically similar cells are formed upon the conjunctivo-palpebral surface opposing the cornea. This active character of these two surfaces causes their frequent union, in these cases, resulting in symblepharon, ankyloblepharon, etc.

D: Stage of reparation and cicatrization. The corneal perforation, although the seat and the dimensions vary in the different cases, is never developed before the fifteenth day. It is blocked by a plug, composed principally of the hypopyon mass and the iris. This plug, at first very fragile, becomes vascular, organized, and gradually transformed into a very resistant connective tissue mass or scar. Later the lids become adherent, and intimately united between themselves and with the healing cornea. The eyeball becomes atrophied into a small stump eventually, and bound up in this mass of connective tissue and adherent structures. In fact, only the microscope can then differentiate between the various structures bound up in, and composing this cicatricial mass. Any attempt to liberate these structures from this vicious cicatricial adhesion, is absolutely impractical and perfectly useless, even if partly successful.

Prognosis and Duration of Ophthalmia Purulenta.

GOLESCEANO, Paris. (*Soc. Fran. d'Oph.—Recueil d'Oph.*, June, 1904.) In 175 observations Golesceano noted the following facts. This disease affected male more than female

children; and the left eye more often than the right. The cases began from twenty-four hours up to the tenth day, 15 per cent. occurring on the third day, 20 per cent. each on the fourth and fifth, and four per cent. on the sixth.

The type with the development of false membrane upon the conjunctiva formed 6 per cent. of the cases; the forms with follicular hypertrophy were not rare; and a grayish infiltration of the tarsus occurred six times. The infiltration or abscess of the cornea appeared between the eighth and twentieth day. Grave early and sudden complications are rare. The complications affect the eye first involved—but to this rule there were exceptions. The eye later affected may become ulcerated, while the eye first affected remains free. The late infiltrations or ulcerations are to be dreaded. They may show themselves even five weeks after the beginning of the purulent ophthalmia.

The duration was from 15 to 45 days, and this without any marked difference that seemed to be due to the treatment. The largest number of cases are recorded as being under treatment for one month. All cases demand after watchfulness, as recurrences are possible. There may be a new outbreak of purulency, even after there has been perfect quiet for some time. This may be after a few days or even after several weeks.

Sclerosis of the Cornea.

JACQUEAU, Lyon. (*Soc. Fran. d'Oph.—Recueil d'Oph.*, June, 1904.) Jacqueau reports the case of a young girl, about twenty years of age, who presented sclerotic, almost symmetrical, changes of both corneae. These lesions consisted in the presence of glistening white circles, extremely opaque, and arranged concentrically around the cornea; narrowing below and to the sides. The greatest encroachment is above, where the pupil at medium dilation is slightly encroached upon. Between the cornea and sclerotic one notices, at some places only, a narrow band of clear tissue. At other places the circles, separated themselves by clear spaces, are fused at points to reappear at short distances, showing two or even three different lines.

On the opaque surfaces the corneal epithelium reflects the light brightly. There is no astigmatism; and the visual acuity is hardly affected. Minute examination of the conjunc-

tiva, both bulbar and palpebral, was absolutely negative; but the patient since the age of four years had always had a little photophobia, and occasional hyperemia. All local agents and astringents employed were without result. The girl had a lymphatic cachexia, and the inflammatory conditions were arrested immediately by sending her to a higher altitude in the mountains, and giving her general tonic treatment. Since three years and a half the corneal condition has remained absolutely stationary; and the girl can remain in town without experiencing the least inconvenience.

Jacquau thinks that in these cases there is a degenerative condition in all respects like that which, in other cases and later in life, causes the true arcus senilis.

He supports this hypothesis by the bilateral character, and symmetry of the lesions; by the lymphatic temperament of the patient; and by the slight degree of photophobia that had become almost permanent.

He insists upon the uselessness of local treatment; while, on the contrary, he extols the very great benefit to be derived from a general tonic treatment and a prolonged stay in some mountain resort at a higher altitude than the former residence.

Optical Value of Iridectomy.

FAGE Amiens. (*Soc. Fran. d' Oph.—Annales d' Ocul.*, June 1904.) It is not generally easy to remedy the troubles caused by central opacities of the cornea. Cylindrical lenses correct but imperfectly the irregular astigmatism. The stenopeic discs, while having the advantage of reducing the zones of diffusion, are not however practically useful.

If one seeks improvement by means of an iridectomy, the operation is not so clearly indicated as in the densely opaque leucomata, and is only to be undertaken under precise indications. It should be small; and placed back of the point at which the curvature of the cornea is least pronounced, and where the transparency is greatest. Without these precautions it may only augment the astigmatism, and increase the blurring.

But to secure a favorable optical result one must get rid of the principal cause of the visual trouble: the diffusion of the misrefracted rays. In this connection the tattooing of the opacity renders considerable service. We have frequently

combined it with a small and narrow iridectomy (sphincterectomy) in this optical treatment of semi-transparent opacities of the cornea.

Musculo-Capsular Advancement for Strabismus Divergens.

Jocqs, Paris. (*Soc. Fran. d'Oph.—Annales d'Ocul.*, June, 1904.) Young woman, aet. 20, emmetropic. Divergent alternating strabismus of 50°! Loss of the function of convergence and of binocular vision. Slight protrusion.

Operation of musculo-capsular advancement in both eyes—by the author's method. Restoration of the normal visual axes, and the convergence and binocular vision. Disappearance of the protrusion.

The right internus was greatly thinned. The deviation to the right had been extreme; the atrophy of the muscle was marked; and there was adhesion of the conjunctiva to the capsule of Tenon, although there had been no previous operation.

Jocqs is of the opinion that, in many of the cases of insufficiency or absence of convergence, one may find the cause in the muscle itself, and not in the innervation of the convergence. For this reason an operation may suffice to re-establish a normal position.

The operations that are directed toward advancement of the muscle alone are insufficient here, as the muscle has become too greatly thinned as a rule. One must have recourse here to a musculo-capsular advancement; detaching and advancing over the whole expanse: the capsule holding the muscle in its thickness.

Glaucoma after Cataract Operations.

DE LAPERSONNE, Paris. (*Soc. Fran. d'Oph.—Annales d'Ocul.*, June, 1904.) Are these glaucomatous accidents due to the operation itself; or are they dependent upon pre-existing general or local conditions? These frequently discussed questions are still very obscure.

The abuse of atropin; the presence of soft layers of cortex; the slight degrees of irido-cyclitic infection; and above all, the wound-inclusion of iris or capsule, are the causes usually advanced.

In addition to these local conditions one can assign a great importance to renal impermeability and uric acid re-

tention, which favors the production of an edema of the vitreous.

In a woman, operated upon for cataract in the regular way, a series of glaucomatous attacks began at the fifth week. The course of the elimination of the urine and of the chlorides demonstrated clearly a uric acid retention at the time of the attack of glaucoma. On employing a special regimen the painful attacks ceased.

This fact, in connection with certain others, proves that in the examination of the general condition of the patient prior to the cataract operation, the renal condition should hold an important place.

This is supported by the results obtained at the clinic of the Hotel Dieu in the treatment of glaucoma by diuretics: treatment not intended as a substitute for iridectomy or the myotics; but which can be made a valuable adjunct, if handled with prudence.

Adrenalin in the Treatment of Glaucoma.

GRANDCLEMENT, Lyon. (*Soc. Fran. d'Oph.—Recueil d'Oph.*, June, 1904.) Many cases observed during the last five years have brought the conviction that we may in the future cure the majority of cases of glaucoma, and even secondary glaucomatous affections of the eye, by means of adrenalin; and without operation.

But to attain this result four conditions are requisite and indispensable:

1. It is necessary that the glaucoma be recent, and that it has not yet had time to produce those incurable organic lesions in iris, ciliary body and irido-corneal angle.

2. It is necessary that the adrenalin be instilled in the eye every half hour without intermission, until the hypertension disappears. This takes generally about three days.

3. It is necessary to employ eserine in connection with it to combat at the same time the two principal causes of the glaucomatous process: the hypersecretion from the congested ciliary processes into the aqueous humor is controlled by the adrenalin; and the defect in its elimination by the closure of the irido-corneal spaces (the canals of Fontana) is controlled by the eserine, which, by bringing the iris forward, disengages these canals.

4. Finally it is necessary to stop or lessen the use of the adrenalin as soon as the hypertension has disappeared; otherwise there may supervene an hypotony (or diminished tension) of the weakened eye, that may be permanent.

One appreciates the importance of this therapeutic advance; and above all, those who have had frequently to perform iridectomy for acute glaucoma. They know the great difficulty which presents frequently at the first step of the operation—the corneal incision, and how hard it is in these cases to introduce the knife between the cornea and iris without wounding the lens. In truth, the treatment by adrenalin combined with eserine, begun at the commencement of the affection, will enable us certainly to often avoid the obligation to have recourse to iridectomy.

(In the discussion no member came to the support of this suggestion.)

Glaucoma after Extraction of the Lens.

DUPUY-DUTEMPS, Paris. (*Soc. Fran. d'Oph.—Annales d'Ocul.*, June, 1904.) This author reports a case of sub-acute glaucoma, developed at the end of ten years, in an eye operated upon by the removal of the transparent lens for high myopia.

The simple section of a capsular bridle remaining adherent to the cornea, was sufficient to cause the glaucomatous symptoms to disappear: and they have not recurred during a year.

The influence of an old operative traumatism, and the rôle of capsular adhesion in the etiology of glaucoma, are undoubted, whatever may be at other times the pathogenetic explanation.

ABSTRACTS FROM SPANISH LATIN-AMERICAN
OPHTHALMIC LITERATURE.

BY

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Subconjunctival Injections of Dionin in Cases of Intra-ocular Hemorrhage.

BLANCO, DR. SANZ, Madrid. (*Archivos de Oftalmologia*, August, 1904.) Blanco reported two cases to the Hispano-American Ophthalmological Society.

He used a 5 per cent. aqueous solution of dionin, with happy results in both cases.

He asks: How shall the method of its operation in these cases be interpreted, supposing its influence to be real?

In explanation he echoes the exposition of Wolfberg, who assigns to dionin an energetic lymphagogue power.

In concluding, the author says: The formation of chemosis necessarily provokes a depletion of the lymphatics of the conjunctiva, having the same effect as a blister in favoring the intra-ocular blood flow.

It must not be forgotten that this depletion effect cannot be direct, since the sclerotic is devoid of lymphatics, or if it has any, they are so few and insignificant, that they cannot be described. But, it must not be forgotten, that, according to recent histologic researches, between the ciliary body and the

most anterior and external face of the vitreous body, small spaces of tubular form exist, at times full of aqueous humor, which puts in communication the posterior chamber with the hyaloid cavity.

Further, taking into account the histologic investigations completed by Berger, it has been made clear that what Hannover and Brucke took for radiated duplications of the vitreous, are in reality lymphatic fissures and canals, and when pathologic exudates intervene, these canals lengthen and enlarge considerably. While these fissures are poor in endothelial investment and make slow the lymphatic current as well as render reabsorption difficult, it does not appear venturesome for me to suppose that the lymphagogue action of dionin, placed in intimate contact with the scleral fibrous covering, makes active these movements of the lymphatic current, and hence reabsorbs foreign products, whether they be blood or exudates.

Contribution to the Study of the Vascular Tumors of the Orbit and of the Cavernous Sinus.

MENACHO, M., Barcelona. (*Archivos de Oftalmologia*, May, 1904.) Menacho presents an exhaustive paper, summing up with the following conclusions:

Although it is impossible to condense in a few lines the clinical standard which we must follow in these vascular tumors, we will hazard the following proposition:

When vascular tumors show slight development, resort should be had to internal treatment previous to a detailed study of the case. This may be combined with local pressure, but we can only entertain hope in some cases of arteriosclerosis. At all events active intervention is only authorized in cases of marked importance and in conformity with the following rules:

Varicosity of the Ophthalmic Vein.—Treatment should be initiated by electrolysis, the bipolon being preferable; when this is ineffectual, proceed to the simple ligation or extirpation of the varix.

Arteriocele.—In the *simple* and *cirsoid* form, electrolysis is indicated as a general method; in aneurism of the ophthalmic artery, when we are convinced that the lesions have root in the orbital portion, the proceeding of preference is the ligation of the ophthalmic, but when the lesions radiate

in the extra orbital portion, then we must resort to the treatment of the tumors of the cavernous sinus.

Exophthalmic Pulsation.—In view of the very slight inclination to spontaneous cure, the expectant treatment is not to be advised.

We recommend the commencement of treatment by compressing the primitive carotid, which compression may be digital or instrumental, the former being preferable; the compression should be accompanied by local pressure through a bandage when possible, and may contribute to a circulatory stagnation and consequently form a coagulum. If compression is not followed by success, it has the advantage of facilitating the collateral circulation, habituating the tissues to the new irrigatory regime consecutive to the ligature, this being an excellent preparation for the operation. It must not be overlooked to prescribe as an adjuvant to this treatment some vaso-motor constrictor like ergot, and use locally.

When compression, as indicated, is not sufficient for a cure, it is in order to resort to ligature of the primitive carotid, if the lesion has its roots in the cavernous sinus.

The ligature shows excellent results in traumatic cases, but when alterations exist in the vascular walls (endarteritis, atheroma) our efforts are not usually crowned with success.

When the ligatures breaks, recourse must be had to the ligature of the other primitive carotid (8 cases are recorded, 2 followed by death), of the external carotid, or of some collateral branch, the aim being to cut off the blood supply, and in some cases an operation upon the orbit direct has been done. These extreme measures have produced some success.

The other methods of treatment, aside from electrolysis, have no application to this infirmity. We resort to them in those cases in which the ligature is not practicable, but then they must be combined with compression of the carotid.

Angioma.—In the *cavernous* and *diffused* form electrolysis is indicated. In the *encapsulated* form, total extirpation is preferable, since electrolysis usually fails, on account of the difficulty in reaching the cavity of the tumor with the needle.

Lymphangioma.—Total extirpation is the remedy.

In the *vascular malignant neoplasms* of the orbit, the only efficacious proceeding is total extirpation, if it may be done early enough. When they are limited or deep, the pre-

servation of the eye may be attempted through the proceedings of Krönlein, Parinaud-Roche or Lagrange, but in grave cases only evisceration of the orbit will be applicable.

Considerations Upon Glaucoma and its Treatment.

BARO, DR., Madrid (*Archivos de Oftalmologia*, June, 1904), in a paper read before the Hispano-American Ophthalmological Society says:

"In view of the difficulties which the operation of iridectomy usually offers, and the uncertainty of its results (statistics give 30 per cent. of good results), before I decide upon operation, I use a method of treatment which has proven satisfactory to me for nearly four years. I refer to the administration of anti-rheumatic remedies, combined with myotic medicaments, and vibratory massage.

Of the anti-rheumatics, none have given me such good results as *rhus toxicodendron*, employed by other colleagues in the form of ocular rheumatism, hence, it occurred to me to try it in glaucoma, Eight to ten drops of the tincture in a half glass of water, should be given twice daily.

Pilocarpine, so beneficially employed in simple glaucoma, has its power much increased if combined with dionin and vibratory massage.

I employ an Edison pen, the point of which is substituted by a small metallic globe, operated by a battery of accumulators. The shock is very mild and is graduated according to the greater or less pressure which it exercises upon the globes through the lids. The number of vibrations is approximately six thousand per minute.

At the end of two months of massage the tension of the eye is notably diminished, the pupil is less contracted, the pain lessens, and in some cases disappears absolutely.

Immediately after the massage, pilocarpine should be instilled, in which event the absorption and the myotic action becomes more accentuated and more lasting.

Massage and the instillations of pilocarpine should be practiced twice daily.

Only in cases of failure after this treatment should operation be decided upon."

The Suppression of the Bandage in Operations upon the Ocular Globe.

MENACHO, DR., M., Barcelona (*Archivos de Oftalmologia*, June, 1904), read an original article on this subject before the Hispano-American Ophthalmological Society. He deduces the following conclusions:

1. The use of the bandage in operations on the globe is not always indispensable.

2. In the use of the bandage we may seek *protection*, *occlusion* or *compression* of the eye.

3. Theoretically it would be possible to dispense with the bandage when the ocular tension is not exaggerated, and the operation has been concluded without accident, but practice demonstrates that in such cases an isolating and protective bandage is sufficient.

4. When there is hyper-tension, prolapse of the vitreous, or of the iris, or if there is a pronounced cough, it is necessary to resort to a compression bandage.

5. In special cases in which the bandage is used, the existence of conjunctival secretion will oblige us to renew the bandage with some frequency.

6. In extraction of cataract, when there is hypersecretion, we must absolutely lay aside the bandage; in all such cases the protective bandage is sufficient (for example, a monocle of celluloid, which permit the most ample movement).

ABSTRACTS FROM GERMAN OPHTHALMIC
LITERATURE.

BY

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An Unusual Foreign-Body Injury of the Orbit.

SALZER, FRITZ, Munich. (*Muenchener Medizinische Wochenschrift*, June 21, 1904.) In Salzer's case, the end of a leather whip-lash one and a half cm. in length entered the orbit through a wound three mm. long in the middle of the upper lid below the orbital margin. A passing cabman in attempting to bring his whip around so as to strike the horse in the abdomen, struck a round smooth stone lying on the ground, the size of a hazel nut, which flew with considerable force, striking the patient over the upper lid and falling in his vest collar. After nine days the lid became swollen and closed; the eyeball was proptosed down and out, with limitation of movement, chemosis and diplopia. Later pus appeared in the wound, the sinus was opened and explored, but without result. The incision wound closed promptly, only to reopen with much escapes of pus a few days later. A probe could then be passed under the roof of the orbit, almost to the optic foramen. Twenty-three days after injury, the foreign body which proved to be a piece of leather whip

lash, appeared in the wound and was removed with forceps.

Salzer explains the entrance of the piece of leather into the orbit, and his failure to find it with the probe, by the fact that the day of the accident was one of freezing temperature, and that the lash was frozen and perhaps coated with ice. In the orbit it became soft, and could then not be detected with a probe. S.

A New Sterilizable Eye Dropper and Glass.

BECKER, F., Düsseldorf. (*Muenchener Medizinische Wochenschrift*, June 14, 1904.) Becker has devised a cylindrical glass or bottle fitted with a rubber cork, through which passes a glass rod terminating in a spiral twist. When removed from the liquid and raised from the oblique to the vertical position, the liquid flows down the groove of the spiral, and off the end, as drops.

The glass and rod, together with the contained liquid, are sterilized as often as required. Change in concentration is prevented by adding 10-12 drops of ordinary water before sterilizing. Becker has found experimentally that this amount is sufficient for a 5-10 g. solution boiled 3 or 4 minutes. S.

Recent Investigation Upon the Physiology and Pathology of the Pupillary Phenomena.

VON HIPPEL, Heidelberg. (*Muenchener Medizinische Wochenschrift*, April 19th, 1904.) In this paper v. Hippel has viewed the extensive literature on the subject and has brought forward in apposition the various conflicting theories.

Clinical facts point to the conviction that the fibres of the optic nerve are in more or less direct relation with the ocular motor centre. Consensual reaction of the pupil is to be explained by the partial decussation of the pupillary reflex fibres, and a central connection between the sphincter nuclei. There have been a number of theories, some of them quite contradictory, concerning the anatomical course of the fibres for the pupillary reflex. The first question to be answered was, are the visual fibres in the optic nerve identical with the pupillary reflex fibres, or, are there for each function anatomically different fibres in the optic nerve, which in the brain, take different courses. It is anatomically certain that there are in the nerve fibre layer of the retina, and in the optic nerve, thick fibres and thin fibres.

Upon experimental grounds Gudden differentiated visual and pupillary fibres. He regarded the thick fibres as the pupillary fibres. Schirmer found that in inflammation of the papilla and optic nerve trunk, the pupillary reaction suffered with the vision, but not always proportionately. In this condition, as the neuritis subsides, the visual fibres recover but very imperfectly, but the pupillary reflex can become perfectly normal, even if there results complete blindness. Or the pupillary reflex may suffer with the visual function, and require a longer time to recover than the latter. Retinal diseases which attack the outer layers, in spite of great visual disturbance, leave the pupillary reflex intact, while those situated in the entire thickness of the retina, or in the inner layers, cause also pupillary disturbances. Schirmer concluded that the pupillary reflex tract begins, not in the rods and cones as does the visual tract, but in the middle layers of the retina, i. e., in the layer of amakrine cells. This hypothesis has neither been proven or disproven. Von Hippel argues two important points against it. Schirmer has himself demonstrated, that the size of the pupil is greatly dependent upon the state of adaptation of the eye. If the reflex arc began in the amakrine cells, these cells must be closely related to the adaptation function, but the rods have been shown to have to do with this function. Again, the centre of the fovea, from which the strongest pupillary reflex can be started, is without amakrine cells.

The oculo-motor nucleus, according to the latest investigations, consists of two principal collections of cells, one on each side of the median line, two small-cell portions lying within the principal collection, one on each side of the median line (Edinger-Westphal) and a single large-cell centre lying in the median line in advance of the centre. Von Hippel, after the experimentation of Bernheimer, which he describes, considers it proven that the small-cell median nuclei are centres for the sphincter pupillae; he does not say, however, that they are the only centres.

Regarding the centripetal pupillary reflex fibre tract, it has been found that a collection of fine medullated fibres leaves the tract just in advance of the external geniculate body, and runs up and in toward the median line. As these fibres enter the white substance of the corpora quadrigemina they radiate, part of them going toward the roof of the quadrigemina

and another part going apparently toward the sphincter nucleus, under the aqueduct. These fibres come from the optic nerve, but whether crossed or uncrossed, or both, is not known. Bernheimer concludes, however, that there is a partial crossing of these fibres in the chiasm, similar to that of the visual fibres. It is probable that the connection between the two sphincter nuclei, is by contact, over the median line, through ganglion-cell processes.

Bernheimer's scheme for the pupillary reflex is as follows: From the retina, through the optic nerve are crossed and uncrossed pupillary fibres; the crossed fibres end in the small-cell median nucleus of the opposite side; the uncrossed end in the corresponding nucleus of the same side. They leave the optic tract at the geniculate body. The centrifugal fibres are uncrossed, and proceed in the oculo-motor nerve from the sphincter centre, through the ciliary ganglion to the sphincter muscle. In the oculo-motor nerve are also uncrossed fibres from the single large-cell median group.

Opposed to Bernheimer's theory is Bach. He claims that the small-cell median nucleus belong to the sphincter. Bach and Meyer advance the following propositions:

1. Complete section of the cervical cord, a few mm. below the fourth ventricle causes no pupillary inhibition.
2. Double-sided section at the end of the fourth ventricle, if in a certain point, causes immediate double-sided pupillary inaction.
3. Section through the right half of the medulla at the lower end of the fourth ventricle causes left-sided pupillary inaction.
4. Exposure of the medulla, with its necessary irritation, is often sufficient to produce complete pupillary inaction with marked miosis. If, now, a complete section of the medulla is made at or above the middle of the fourth ventricle, the pupil promptly reacts.
5. Unilateral section farther above permits immediate reaction on both sides.

The conclusions are that at a very small point in the lower end of the fourth ventricle is a *reflex inhibitory* centre, and above, or cerebralwards, is a secondary reflex centre.

Total decussation of the centrifugal reflex tract cannot be accepted, because, were this the case, chiasm-section would cause only consensual pupillary reaction, but not direct. With

tract-section, we would get only direct but not consensual reaction. But by both experiments, both direct, and consensual reaction are retained.

By partial decussation, all the phenomena can be explained, but the course of the fibres is still in doubt.

The whole question is still further complicated by recent investigation into the nature of the ciliary ganglion.

Schwalbe, Antonelli, Goldberg and Peschel consider this ganglion purely spinal, and as belonging to the oculor motor. His, Remak, Phisalix and Gehuchten explain it as also spinal, but as belonging to the trigeminus.

Retzius, Michel, Rauber, d'Ercline and Kolliker explain it as purely sympathetic, because it contains only multipolar cells; the fibres transmit always from the cells, and never to them. Krause contends for a double or mixed nature of the ganglion, and Hotzman believes it different in different classes of animals. The ciliary ganglion is probably a peripheral center for the pupillary reflex.

Concerning the nature of the pupillary reaction during convergence and accommodation, nothing definite is known. Also the anatomical relationship between the three kinds of pupillary reaction (light accommodation and convergence) is unknown.

To these three have been more or less recently added the pupillary contraction upon forced closure of the lids; Haab's cortical reflex, and the "attention reflex" of Piltz.

The "lid reflex" is a contraction of the pupils during forced orbicularis action. It is obtained by holding the lids open while the patient endeavors to close them. It is most often obtained when there is double mydriasis. Bumke has found the phenomenon in dementia praecox. The theoretical explanation is still in doubt, and it has not, as yet, obtained diagnostic importance.

Haab's cortical reflex is as follows: In a room lighted only by a lamp or candle flame, the light is placed in front of and to the side of the subject, so that he looks past it toward a dark wall. If now, without changing the direction of his eyes, he fixes his *attention* on the light, there will be a strong contraction of the pupils. As soon as the attention is taken from the light to the fixation point on the dark wall, the pupils dilate.

The attention reflex of Piltz is a modification of the fore-

going. The attention directed to an indirectly seen dark object at the side and to the front, causes dilatation of pupils; and, vice versa, when a bright object is used, pupillary contraction. The true existence of both these reflexes is in doubt, and they both are as yet without diagnostic import.

Pupillary dilatation is also complicated. The sympathetic tract to the dilator muscle is as follows: The fibres leave the cord with the lower cervical and upper dorsal nerves; they go through the rami communicantes over the superior thoracic ganglion, and the inferior cervical ganglion, to the superior cervical ganglion. They then leave the carotid plexus, and collect in the Gasserian ganglion, and reach the dilator through the long ciliary nerves. The dilator fibres do not touch, or at most only a small part of them, the ciliary ganglion.

The sympathetic fibres, which, from the carotid plexus form the sympathetic root of the ciliary ganglion, are probably blood-vessel fibres.

Bach and Meyer place a reflex inhibitory dilator centre near the inhibitory light reflex centre; they believe that there are several centres for pupillary dilatation.

The paradoxical pupillary dilatation of Langendorff is as follows: When the sympathetic is cut below the superior ganglion, and then the ganglion is extirpated, the pupil which is already contracted becomes more so. This contraction is but temporary and soon changes to dilatation. An animal with the right ganglion extirpated, and the left sympathetic cut, has the right pupil the more dilated. This reaction has not been observed in man.

Pathologically v. Hippel considers the light-reflex pupillary-inaction (Argyll Robertson pupil) the most practical and important phenomenon.

This pupillary phenomenon is almost always bilateral, and is generally, but not always, accompanied by contracted and often unequal pupils.

Monolateral Argyll Robertson pupil has been observed. It has been observed to remain so, or to later become bilateral. The accommodation and convergence-reaction are, as is known, retained.

Von Hippel, with reference to the work of the several investigations cited, regarding the anatomical trails for the pupillary action, asks the question: Is the lesion producing the

Argyll Robertson pupil, in the light-reflex arc or elsewhere, especially in the cervical cord? He concludes with the following observations: 1. Although the Argyll Robertson pupil is generally accompanied by miosis, the reflex inaction may remain constant with pupils which constantly change even to mydriasis. This would indicate that the miosis and the reflex inaction are not due to the same lesion. The miosis has been explained by sympathetic paralysis, but the arguments, therefore, are not unanswerable.

Von Hippel believes that the miosis is not due to sympathetic paralysis, because, with the Argyll Robertson pupil, the other ocular sympathetic actions remain normal. Both seek to explain the miosis by irritation of the inhibitory centre for dilatation. 2. The trails for accommodation and convergence-reaction of the pupils, and their relation to those for the light reflex, are not known. 3. It is as yet uncertain if the lesion causing the Argyll Robertson pupil is always in the same place.

The Classification of Optic Neuritis.

KOENIGSHOFER, PROF. DR., Stuttgart. (*Die Ophthalmologische Klinik*. July 20, 1904.) Koenigshofer calls attention to the lack of uniformity in classifying optic nerve affections as neuritis. Especially is "choked disc" confusing, which by some is considered a neuritis, and by others not.

Fuchs classifies neuritis ophthalmoscopically into (1) Neuritis which from the beginning can be recognized by the ophthalmoscope, i. e., intraocular neuritis, or papillitis (Leber) and (2) Neuritis, which shows none or very little differentiation, intraocular neuritis (papillitis, choked disc), neuroretinitis (neuritis descendens of v. Graefe), and retro-bulbar neuritis. Fuchs and von Graefe, however, suggest that as first shown by Jacobson, choked disc can appear without inflammation, it need not be a true neuritis.

Koenigshofer thinks that the term retro-bulbar neuritis should not be used, for, without its consequences to be seen at the disc, the inflammation may attack any point in the nerve without being recognized. Visual disturbances often precede ophthalmoscopic changes. It can be said that many well marked cases of optic neuritis, seen ophthalmoscopically, were at one time retro-bulbar, and every retro-bulbar neuritis can in time reach the nerve head. Retro-bulbar,

as-observed, is to be considered a *stage*, never a symptom, and least of all a definitely limited diseased process.

Michel gives a classification based on the pathologico-anatomical, as well as on the clinical peculiarities of the process. He considers choked disc in a special chapter on diseases of the orbital portion of the optic nerve, under the heading "circulatory disturbances" and "edema of the papilla." Under "neuritis optica" he considers only those processes which are true primary inflammation of the nerve or of its sheath.

Perineuritis is an inflammation of the sheath, or one starting from it; and interstitial neuritis is one attacking the processes entering the nerve from the pial sheath. They can exist together, or the one can follow the other, and clinically they are difficult to differentiate. He then considers an etiological classification. Neuritis from basal meningitis is the most frequent; then from brain abscess, suppurative softening from sinus-thrombosis; suppuration in the orbit and frontal sinuses (consecutive neuritis) and primary neuritis from infectious diseases, principally tuberculosis and syphilis, without accompanying brain disease. Aside from these are cases of neuritis from similar causes, as multiple neuritis, and neuritis from intoxication and auto-intoxication, and that following the infectious diseases under the heading. Hereditary neuritis is in a special class.

Koenigshofer, following in part Michel's classification, advocates the recognition of two great classes of neuritis quite distinct from each other. This follows the fundamental division of diseases of the spinal cord with two classes and is (1) Transverse or diffuse disease, (2) System disease. The pathologico-anatomical characteristic of the diffuse form is that the process is just the same whether it springs from the sheath or from the interstitial tissue; it traverses the entire cross section of the nerve, and can spread just as well transversely as longitudinally.

The characteristic of the system disease is that the process is limited to definite bundles of fibres, and extends longitudinally, but does not attack near-lying bundles.

Under the first heading are all those diseases which, from the first, show ophthalmoscopically involvement of the entire nerve head, and in which central and peripheral vision fail hand in hand. Cases with central scotoma at first, which

spreads until it finally embraces the entire field, belong here.

The second heading includes those processes which show themselves from the first as definite defects in the visual field, for example, involvement of the papillo-macular bundle, with well defined central scotoma.

Considering optic nerve diseases from an etiological standpoint as well as from Koenigshofer's classification, we have three characteristic groups: 1. Diseases which cause transverse or diffuse involvement of the nerve only. 2. Diseases which cause only systemic involvement (fibre systems). 3. Diseases which can cause both diffuse and systemic involvement.

Under group 1, are neuritis from brain abscess, meningitis (otic), epidemic cerebrospinal meningitis, sinus thrombosis, acute and sub-acute myelo-meningitis, tuberculosis and syphilis meningitis, and suppuration in the orbit and neighboring sinuses. Also less frequently, the neuritis occurring in scarlet fever, influenza, pneumonia, erysipelas, diseases of the teeth, typhus, septicemia, mumps, measles, and very seldom carcinoma and nephritis. It is doubtful if neuritis does not proceed from the retina.

Under group 2 are neuritis from intoxication and nutritional diseases, tobacco, stramonium poisoning; diabetes and beri-beri. Also poisoning from iodoform and thyroïdin, gout and severe hemorrhage.

Under group 3 is neuritis from hereditary causes, multiple neuritis, disseminated sclerosis, pregnancy, puerperium and menstrual disorders. Also poisoning from lead and coal gas

Clinically optic neuritis is divisible into two classes: 1 diffuse or transverse disease, which follows infectious processes, and 2, system disease, which follows intoxication and nutritional processes. S.

The Underlying Principles in the Treatment of Myopia.

SATTLER, H. (*Deutsche Medizinische Wochenschrift*, April 21st, 1904.) Sattler discusses the question of the full correction of myopia, which practice he is unalterably in favor of. Heredity plays a very important part in the determination of progressive myopia, those having high grade and progressive myopia frequently belonging to families in which this disease can be found for several generations back.

The changes in the eyeground at the posterior portion of the globe he regards as never the cause, but always the result of myopia.

Of the first importance in the treatment of myopia is attention to the distance at which near work is done, and a proper regulation of the time, light, and other conditions under which it is pursued. Sattler believes that the only, in a measure at least, sure means for the prevention of progressive myopia is the constant wearing of the full correction from the start. His method of treating myopia is as follows: The determination of the error by retinoscopy, and when necessary by the use also of Javal's ophthalmometer. Only in the higher grade is the far point directly determined by small type. Astigmatism when present is never neglected. The muscle balance for distance and near, with and without glasses, is determined. For myopia of .75 D. and more, full correction for distance is recommended. It is very important that near work should be done at a distance of 30-40cm.

Up to 25 years of age, the constant full correction of myopia as high as 10.D. is well borne. Beyond 25, 5 or 6.D. can be fully corrected. Myopia greater than 5 or 6.D. requires a reduction of 1 or 2 D. for near work.

Sattler finds that under full correction, the relative accommodation adjusts itself so as to approach that in emmetropia. Regarding the small retinal images, Sattler says that when the glass is placed at the anterior focal point of the eye, or about 13 mm. in front of the cornea, the retinal images are not smaller than they are in emmetropia. It is important therefore to place the glass as close to the eye as the lashes will permit.

In myopia of 12-18.D. he says a constant full correction can no longer be thought of. In these cases it is also important to have as great a working distance as possible. A reduction of 3 or 4 D. is made for near work, which glass is worn, and the correction is brought up to full by an additional glass for distance.

When, for any reason, the proper reading distance cannot be maintained, weaker glasses, combined with low prisms, base in, must be resorted to. With the middle and higher grades of myopia, insufficiency of convergence is almost constant. With full correction, however, Sattler believes it can be made to disappear, or at least be greatly lessened. But

in some cases, in spite of full correction, there remains a marked insufficiency of convergence, which may cause troublesome asthenopia. The muscle balance is then studied with the Maddox rod at 5 m., and the facultative divergence power is measured with prisms. If there be, for example, at 25 cm. a dynamic divergence of 16° to 20° and at 5 m. an exophoria 6° to 8° , a careful tenotomy of an external rectus is indicated. If there is marked insufficiency of convergence without latent divergence, operative treatment is contra-indicated; abducting prisms for near must be used.

Extraction of the crystalline lens, S. practises in high grade myopia in children, or in individuals up to 36 years. This he does where the mechanical effect of the strong glasses limits the patient's vision too much.

An eye which is corrected by an 18 or 20 D. lens, becomes after lens-extraction, adjusted for parallel rays.

S. extracts the lens through an incision made with a Weber lance knife in the cornea, at the upper margin of the dilated pupil. S.

The Extinction of the *Cysticercus Cellulosae*

HIRSCHBERG, J., Berlin. (*Berliner Klinische Wochenschrift*, June 26th, 1904.) H. shows that by proper meat inspection, the *Taenia Solium* in Germany is becoming exceedingly rare, and therefore cysticercus diseases, which were formerly common in that country, are now scarcely ever met with. He gives the following table:

	Years.	Eye Patients.	Cysticercus.	Proportion.
v. Graefe,	1853-1856	80,000	90	1:888
Hirschberg,	1869-1885	60,000	70	1:857
"	1886-1894	73,000	3	1:24333
"	1895-1902	65,000	0	

Those who eat raw or insufficiently cooked pork are exposed to the dangers of the cysticercus. If the meat contains the cysticercus, the patient suffers not from the cysticercus cellulosae of course, but from the developed tape worm. There are now two possibilities of self infection, one from within and one from without. A section of the worm loaded with eggs may pass up into the stomach (not likely), or the eggs may be accidentally carried from without to the

mouth. The simultaneous presence in the same patient of the tape worm and the cysticercus cellulosae is of more frequent occurrence than has been supposed.

The embryos may be introduced with drinking water or with vegetables. The mode of living is of great influence. H. finds that when numbers of persons live together in a disorderly manner, the cysticercus is more frequent, than with the higher class of people, living under better hygienic conditions.

The report of a case with a description of an eye lost 20 years previously by cysticercus is given.

The Injurious Effects Upon the Eye of Modern Lights, and Their Prevention.

STAERKELE, ARNOLD, Basel. (*Archiv. für, Augenheilkunde*, June, 1904.) This paper is a lengthy one, in which the author experimentally determines the effects upon the eye of the various kinds of light in modern use.

There are three kinds of light rays: 1. so-called heat rays with a velocity of 171-342 billion undulations per second (ultra-red, invisible, dark and long undulations). 2. Luminous rays with a velocity of 342-684 billion undulations per second (the red, orange yellow, green, blue and violet rays of the spectrum). 3. Ultra-violet rays, with 684 billion undulations per second (invisible, of short undulation, refractive or chemical). They exert chemical action especially upon silver salts, and have been called "chemical rays."

S.'s conclusions are: 1. The injurious effects of a light on the eye increase with the number of short-undulation rays contained. 2. The various lights in use are arranged as follows, according to the proportion of short-undulation rays contained therein. a. Petroleum, b. Gaslight, c. Electric light d. Auerlicht, e. Acetyline. Petroleum light contains the fewest, and is therefore the least harmful, acetyline, the greatest number of these rays, and is the most harmful. 3. The short undulation rays can be diminished by passing them through thick glass of certain colors. The most efficient colors in this respect are gray-yellow, red, and green.

Gray-yellow glass (Fiengalglas) was used by Fiengal in 1885-87 for protection glasses, based on the experimental work of VanGenderen Stort, which showed that pigment

wandering, and movement of the retinal elements, were at a minimum under yellow light.

The Question of Pressure Bandage in the Treatment of Detached Retina.

ASMUS, EDWARD, Düsseldorf. (*Muenchener Med. Wochenschrift*, April 19th, 1904.) A. calls attention to the warning of Förster against the use of pressure in treatment of detached retina. Förster believed that it interfered with the nutrition of the vitreous, which led to diminished intra-ocular tension, and was surely not favorable for the existing condition. He used a light diagonal bandage, but avoided all pressure, other than just sufficient to close the lid, protect the eye from light, and cause slight immobilization.

A. details three cases of myopia detachment which were cured in this way with, of course, the administration of appropriate resorption remedies, and advocates the use locally of a little cotton pad and a light bandage without pressure.

The cases were observed for a long time, and the cures seemed permanent.

Case 1, had a myopia of 5 D., a rather low amount to cause detachment. A. suggests that this may indicate the cause to be primarily in the chorioid.

Case 2, was myopia about 7.5 D. and after reattachment was given free correction, which was not found to be harmful.

Case 3, after recovery continued his work as laborer in an iron foundry without detriment. S.

The Relationship Between Trigeminal Neuralgia and Recurrent Corneal Erosion.

BARTELS, M. (*Muenchener Med. Wochenschrift*, April 26th, 1904.) The cause of recurrent corneal erosion has been variously explained, but more recently it is believed to be of nervous origin, i. e., dependent upon disturbance in the trigeminus (Hulke, Hirsch). Szili believes the underlying cause to be the separation of the corneal epithelium, which he demonstrated to take place in this disease when the eyes are first opened after sleep. Peters contends that the cause of the recurrence is injury to the corneal nerves, the separation of the epithelium being only a symptom. After injury to the nerve-ending in the cornea, the neuritis causes

edema, even in spots where there has been no direct injury. The edema separates the epithelium.

B. supports the nervous theory and reports 3 cases of recurrent erosion following injury, in all of which there were disturbances of the trigeminus nerve, i. e., trifacial neuralgia, mostly supraorbital. The primary injury affects a nerve already disposed to neuralgia; or at the time of injury one of the nerve trunks, for example the supraorbital, is injured, which gives rise to the trifacial neuralgia.

B. recommends that if after a corneal injury the patient suffers from neuralgia, attention be given to the treatment of the latter as well as to the local treatment of the cornea.

Sodium salicylate, quinine, pyramidon, rest in bed, hot applications, and the injection hypodermically of Schelich's morphine and cocaine solution, are recommended. The constant current with anode over the exit of the nerve, applied at first for two or three minutes, is of use. S.

The Cause of Congenital Dacryocystitis.

ZAZKIN, A. B., *Nowogradwolhyrisk*. (*Wochenschrift für Therapie und Hygiene des Auges*, Aug. 11, 1904.) Zazkin reports a case of dacryocystitis in an infant, noticed by the mother four days after birth. Fifty cases are found in German literature up to 1900, to which are added five cases from Russian literature since that time. The left lacrimal sac was the most frequently affected. Zazkin's case was a phlegmonous inflammation, which, from the reported cases, is exceedingly rare.

The investigation of Prof. Ewetzky shows that the lacrimal canal is not uniformly developed in all its parts. It thus happens that the walls grow together. Toward the end of the uterine life, the lower end of the canal is covered by two membranes, the lower being a continuation of the nasal mucous membrane; the upper, a little higher, lies in the canal. When the disappearance of these membranes from any cause is delayed, the secretions accumulate, with the result of dacryocystitis formation, analogous to that in after life. The closure of the canal is simply a favorable circumstance for the accumulation of secretion, and micro-organism infection. Some authors attribute the faulty development of the canal to syphilis. The special investigations of Alexander, however, show that the lacrimal cana

the end of the cigar from becoming wet with saliva. To this class belong also pipe smokers and cigarette smokers.

Wet smokers hold the end of the cigar between the teeth, chew it, and allow it to become soaked with saliva. It is certain that dry smokers receive into their system much less nicotine, pyridin, ammonia, etc., the products of dry distillation, than do wet smokers.

The former have two opportunities for the absorption of these products 1st., from the buccal cavity, mixed with saliva and swallowed; 2d., by inhalation, they may reach the mucous membrane surfaces of the respiratory tract, but they are greatly diluted. With the wet smoker it is more serious. In addition to the above is the greatly increased danger, due to the fact that the nicotine, etc., collect in the wet end of the cigar, and reach the stomach in a more concentrated form. The danger is still further increased if the smoker uses also alcohol, for the alcohol acts as a vehicle for the ingested poisons, and facilitates greatly their absorption. Therefore, with a wet smoker, it is not so important to know if he is a confirmed alcoholic, but sufficient to know if he uses alcohol at all, even in moderation.

Bamberger is of the opinion that the dry smoker endangers his health relatively little, and that when disease from tobacco abuse (gastritis, amblyopia, arterio-sclerosis with or without angina pectoris, etc.) are found, the victim is a wet smoker. That cigarette smokers are frequently injured in health although dry smokers, Bamberger considers due to the fact that so many cigarettes are generally daily consumed, and to the great tendency to inhale the smoke.

Chewing tobacco, Bamberger considers practically free from danger, because of the very small amount of nicotine contained, and the absence of combustion products. As prophylactic measures, Bamberger recommends that the dangers of wet smoking be pointed out to those still uninjured, and that the bad habit of keeping the cigar constantly in the mouth, without a holder, of course, be discouraged, as it leads to wet smoking. With those suffering already from nicotineism, it is not sufficient to reduce the quantity of tobacco used, but they must also learn to smoke dry.

Thoms experimented with cotton filters soaked in iron

salts. The injurious bases from the tobacco were thus held back. Chloride of iron acts particularly well.

Bamberger recommends the tamponing of the cigar holder with cotton soaked in chloride of iron, as hygienic and economical, inasmuch as an inferior cigar so smoked acquires a much better flavor. S.

Keratomalacia.

UNTHOFF (*Wochenschrift für Therapie und Hygiene des Auges*, August 25th, 1904), presented a case of xerophthalmus and keratomalacia. One eye was already lost by panophthalmitis, the other showed beginning xerosis and keratomalacia with marked night blindness. This eye was saved by careful attention to nutrition, in spite of the fact that the patient was an alcoholic, an epileptic, and a dement.

In discussion, Prof. Hermann Cohn said that these cases were extremely rare. He saw in his clinic, out of 100,000 eye patients only 46 cases of xerosis of the conjunctiva and 22 of the cornea.

In Egypt, however, it is very common, mostly resulting from trachoma. In a series of 17 cases described by Cohn, 11 were poorly nourished children, and 6 were in adults, following trachoma. In Russia, it appears epidemically during fasting times, and many persons are afflicted. The dryness and night blindness disappear when meat is again eaten. The essential point in treatment is the building up of the nutrition.

Ocular Disturbances of Malarial Origin.

(Note by PIERO CHIARINA. Bollatino del Ospendale Oftalmico della Provincia di Roma, July, 1904. Ref. from *Wochenschrift für Therapie und Hygiene des Auges*, August 25th, 1904.)

The eye affections of malaria are acute and chronic. To the acute eye disturbances in severe cases of malarial fever, belong temporary or intermittent amblyopia and amaurosis. Cases of amaurosis accompanied by aphasia, hemiplegia and an hemianesthesia have been noted. Also hemianopsia has been observed. The amaurosis lasts from $\frac{1}{4}$ or $\frac{1}{2}$ to 10 hrs. It generally continues during the entire fever attack and disappears with profuse sweating. It is more frequent in the tertian form, and less so in the quotidian.

One case has been referred to, having night blindness followed by amaurosis. The optic disc shows edema. The transient amaurosis frequently passes into complete atrophy of the optic nerve. Hemorrhages often accompany the amblyopia or amaurosis. The diagnosis is not difficult, with the symptoms of malaria.

From quinine amaurosis, it is readily distinguished. The latter has much longer duration, and gives the ophthalmoscopic picture of ischemia; the nerve head appears atrophic, and there are no hemorrhages in the retina.

On the other hand, malarial amaurosis is characterized by signs of hyperemia, papillary edema, optic neuritis and retinal hemorrhages. Recovery usually occurs, but it may cause blindness from optic atrophy.

Quinine amaurosis runs a long, slow course and has relatively good prognosis. Vision can in a measure return after months.

The fields in the two affections are different. That in quinine amaurosis is more contracted, patients frequently being able to read who cannot go around on account of the contracted field. Other ocular changes, in acute malarial infectious, less frequently seen are cataract in young subjects, and ulcerative keratitis dendritica. S.

The Effects of Sunlight Upon the Skin and Conjunctiva.

KREIBECH, KARL. (*Wiener Klinische Wochenschrift*, Aug. 24th, 1904, Ref. from *Wochen. für Therapie und Hygiene des Auges*, August 25th, 1904.) Direct sunlight causes two kinds of skin affection, hydroa vacciniforme (Bagin) and the summer pruritis of Hutchinson. The eruption of hydroa vacciniforme is similar in nature to urticaria wheals. Kreibach has observed three cases of this kind in which the bulbar conjunctiva was affected. Clinically they resembled spring catarrh. There was infiltration and node formation upon the conjunctiva with dilated blood-vessels. Kreibech believes it probable that this condition was caused by the rays of the sun, and recommends as a prophylactic measure the wearing of red glasses, and as a therapeutic measure, an occlusive bandage.

He also believes that those cases of spring catarrh which have been observed, accompanied by swelling of the lymphatic glands, can acquire the latter symptom from direct

sunlight, which has a penetrating power demonstrated by numerous experiments. S.

Tutulin

(*Wochenschrift für Therapie und Hygiene des Auges*, August 25th, 1904.) Tutulin is a chemically pure, homogenous vegetable preparation containing 98 per cent. of albumen and 2 per cent. of amide. It is a yellowish white powder without taste or odor and is very stable. It is of great service in aiding nutrition, and can be added to foods or drinks, 2 or 3 teaspoonfuls daily. It is of special use in the treatment of gastro-intestinal disorders, nephritis, diabetes and convalescence. S.

Boison.

(*Wochenschrift für Therapie und Hygiene des Auges*, September 1st, 1904.) Boison is an albumen-iron-lecithin combination, containing about 80 per cent. albumen. It is without odor or taste and has given excellent results in building up the body nutrition.

Electricity in the Therapy of Eye Diseases.

HANKE, VICTOR, (*Heilmittel Revue* No. 6, 1904. Ref. from *Wochenschrift für Therapie und Hygiene des Auges*, September 1st, 1904.) In a general therapeutic way electricity is of use in the treatment of eye muscle paralysis, and in the neurasthenic or hysterical amblyopias. More locally applied, successful results follow its application to angioma and lymphadenomata. The negative pole armed with a platinum or iridium needle is inserted into the tumor which may be in the lid or in the orbit. In orbital tumors it may be inserted 4 or 5 cm. deep into the orbit. Care must be taken not to injure important structures.

The positive pole, in the form of a plate electrode, well moistened, is placed against the cheek or neck. The current, which should not be more than 5 ma., is then closed. The passage of the current is made manifest by the appearance at the wound of entrance of the needle, of bubbles and foam mixed with blood. The current is continued until these bubbles cease, which shows that particular portion of tumor is thrombosed. The needle is then put into another portion of the tumor. At one sitting four or five such punctures

may be made. The treatment may be repeated in one or two weeks.

For children or nervous patients, anesthesia is desirable. The treatment should be carried out with some system, so that every portion of the tumor, so far as possible, can be successively reached. It is better to begin on the periphery.

Another very useful application of electricity, is the removal of misplaced cilia (trichiasis). The causes of trichiasis are usually scar formation, a sequel of trachoma, traumatic coloboma of lid, old blepharitis, burns and congenital conditions. Electrical epilation is performed by passing a very sharp slender needle along the lash down to the follicle. The anode is placed on the cheek or neck. The current should be 2 or 3 ma. Bubbles appear as in the preceding case. One or two minutes' application suffices to destroy the follicle; the hair is then easily removed. Cocain injection is recommended if many lashes are to be removed.

The clearing of corneal scars may be accomplished by electrolysis. For this purpose the cathode should be a button-shaped electrode 2 or 3 mm. in diameter. The cornea must be well cocainized, and gently massaged with the electrode for about $3/4$ to $1\frac{1}{2}$ minutes. The strength of current must not exceed 1 ma. Anode as before. There is almost always considerable reaction, which is to be guarded against by atropine and hot compresses. The procedure may be repeated in a few days. The results are not very brilliant, but electrolysis is to be tried after other measures have failed.

The more extensive and newer applications of electricity are, first, for the relief of pain; second, for the relief of spasm, and third to allay the inflammation. For the relief of pain electricity can be used in all painful eye diseases, especially in iritis, iridocyclitis, episcleritis and scleritis. The Faradic current should be used, after the method of v. Reuss. The patient holds one wet electrode in the hand; the other, in the form of a ring, is placed over the closed eye. The application lasts 3 to 5 minutes. The surgeon, by placing himself in the circuit, can regulate the strength of the current from his own sensations.

The Faradic current applied in this way gives good results in the treatment of photophobia and blepharospasm, especially that due to eczematous conjunctivitis. It is contraindicated if there be ulceration of the cornea or much secre-

tion. One application often suffices to allay long standing blepharospasm in scrofulous children.

Vitreous opacities seem to disappear more quickly under the Faradic current; also blind eyes, which are painful and irritable may be saved enucleation by its application.

As an antiphlogistic, the constant current is of less value, but, as above stated, it relieves the subjective symptoms. A current of 1-1 1/2 ma. may be directly applied to the cocainized focus of inflammations for 1-2 minutes, or the eye may be placed in an electrical bath of normal salt solution.

In general, in selecting the pole to be placed in contact with the eye, it may be stated that the anode has a more calming, and the cathode a more irritating affect. S

An Automatic Cold Compress.

(Ref. from *Woch. für Therapie und Hygiene des Auges*, September 1, 1904). This is a substitute for the ice bag. It consists of a leather bag in which is prepared sponge and covering, which on one or both sides are flexible wires which do not rust. Before using, it is soaked in cold water; it is then squeezed out, and the wire-covered surface is placed against the part to be cooled. The metal conducts the heat from the body into the stored up water within the sponge. It remains cold for a long time. S.

Virulence of the Xero-Bacillus.

DORET, F., (Inaugural Déssertation, Genf. 1904. Ref. from *Wochenschrift für Therapie und Hygiene des Auges*, September 1st, 1904.) Doret found cultures of xero-bacillus always richer and more virile when grown on an inflamed, than when grown on a healthy conjunctiva. The virulence was also increased when in the presence of other pathogenic germs, as the gono-pneumo- and staphylococcus. In rabbits and guinea pigs, pure cultures were introduced into the cornea and anterior chamber. In the cornea, they cause a light rapidly healing infiltration, but in the anterior chamber they produce a distinct iris hyperemia, or marked iritis, with cloudy aqueous and exudate. Under atropine, the pupil dilated, and recovery followed. S

A Rare Corneal Injury.

ULBRICH, H. (*Klin. Monatsbl. f. Augenheilk.*, March, 1904.) A woman, aet. 23 years, accidentally divided her cornea, producing a large flap without entering the anterior chamber. The flap became cloudy on the following day but healed to the raw surface below. A month after the injury the patient's vision was 6/20. This class of corneal injury is very rare; furthermore conservative treatment, i. e., allowing the flap a reasonable period to heal, should be observed.

Hydrogen Dioxid in Ulcus Serpens.

KIMPEL, (*Monatsbl. f. Augenheilk.*, June, 1904,) reports a peculiar manifestation in the employment of hydrogen dioxide in a case of serpiginous ulcer of the cornea which did not respond satisfactorily to the cautery. After removing the white froth resulting from an instillation of H_2O_2 , white radiating lines were observed in the immediate vicinity of the ulcer. These lines were resolved into minute vesicles by the assistance of a loupe. The phenomenon became less pronounced as the inflammatory infiltration subsided and regeneration progressed. The vesicles are formed by a kato-lytic process by the leucocytes which have wandered into the inflammatory focus, evidenced by the fact that the minute vesicles were only found in place of the grey lines and dots expressive of the inflammatory infiltration. The rapidity of the development of the vesicles can be ascribed to the inflammatory loosening of the corneal lamellae.

A New Method of Blepharotomy.

HALE, A. B. (*Klin. Monatsbl. f. Augenheilk.*, June, 1904). There are objections to both v. Graefe's suture and Fuchs' method, later modified by Czermak. The former leaves an unsightly scar, while the latter may cause an inversion of the eyelids. Among the indications for their employment may be enumerated trauma, Basedow's disease, and a long existing paralysis of the facial nerve. The essayist recently devised an operation for the last named condition in a girl aged 23 years, as follows:

The locality for the new lid margin should be marked on both eyelids. An incision 5 to 6 mm. in length is made on the lower lid; a second incision beginning with the lower termination of the first is made parallel to the lid margin

and is continued to the external canthus. The skin with its hair and follicles is now removed from this surface.

A corresponding area only 1 mm. greater in extent in all directions, is marked on the upper lid; everything is removed under the skin commencing with the lid margin, hair follicles, tarsus and conjunctiva. The upper lid possesses a skin flap while the lower has a counter flap to fit under it; the former sewed upon the latter will produce a complete lid. The sewing is accomplished by means of a thread armed with two needles which are first plunged through the conjunctival flap of the lower lid and then through the skin flap of the upper, held in place by an assistant. The ends of the thread are tied over a small piece of gauze. The final adjustment of the skin flap may be insured by a few fine stitches. The advantages gained are: The unaltered anatomical relations, the natural appearance of the new canthus and the almost invisible scar, hidden by the normal folds in the skin of the eyelid.

A Contribution to the Pathology and Pathogenesis of Choked Disc.

KAMPHERSTEIN, Breslau, (*Klin. Monatsbl. f. Augenh. heilk*, June, 1904). The numerous theories for the explanation of this interesting condition are enumerated, from the period of v. Graefe to the present. The material on which the essayist's conclusion are based consisted of 55 eyes, 44 cases with choked disc; 51 eyes are from cases of cerebral affection, 44 times tumors of the cerebrum or cerebellum, once lues cerebri, once brain abscess, twice cysticercus cerebri, once actinomycosis of the base of the brain, once a solitary tubercle. In one case there was a chronic nephritis with apoplexia cerebri cresceus. Three of the remaining 4 cases were due to orbital tumors (2 sarcomata and 1 carcinoma). The last case of choked disc followed a necrosis of the cornea as a consequence of diphtheria of the conjunctiva.

A careful study of the above material gave the following statistics for choked disc following cerebral affections:

Of 51 cases of choked disc.

The subvaginal space of the optic nerve was not

widened 19 times.

“ “ “ “ “ “ was widened 32 “
decidedly widened 19 “

The subvaginal space of the optic nerve showed inflammatory infiltration	38	"
The subvaginal space of the optic nerve showed inflammatory manifestations and widening	23	"
The subvaginal space of the optic nerve showed inflammatory manifestations without widening	15	"
The optic nerve was apparently normal	5	"
" " " showed edema	30	"
The optic nerve showed inflammatory manifestations	28	"
" " " " " " "		
and edema.	19	"

Of 42 cases of choked disc.

The lamina cribrosa bulged forward	33	"
" " chorioidea " "	1	"
" " cribrosa was not bulged forward	9	"
" papilla showed inflammatory manifestations	27	"
" " " no " "	15	"

The Schmidt-Manz theory is not acceptable on account of the high percentage of choked discs without hydrops of the subvaginal space of the optic nerve. In only 40 per cent. of the cases was the hydrops vaginae nervi optici of sufficient extent to influence stasis, neither could a compression of the central vessels be detected.

From the above preparations the essayist is unable to comment on Deyl's theory, which has many theoretical considerations in its favor.

The inflammatory theory is inadequate for the explanation of many of the above cases. In many cases of fresh choked disc there were no traces of any inflammatory manifestations in the papilla or the optic nerve. In other cases the inflammatory changes were extremely slight. The presence of choked disc in chronic hydrocephalus and hemorrhagia cerebri and its infrequent occurrence in meningitis, a pronounced inflammatory condition of the brain, also disfavours the inflammatory theory. A neuritis may under certain conditions reach the elevation of choked disc, as was shown by a case of choked disc as a consequence of a diphtheritic necrosis of the cornea.

The author arrives at the conclusion that the explanation of choked disc in the majority of cases is to be traced to an edema of the brain, propagated into the optic nerve

through the lamina cribrosa into the papilla, where it produces a form of incarceration manifestation of the intraocular termination of the optic nerve in the rigid scleral ring, and the slightly resient scleral portion of the lamina cribrosa with the resultants welling as indicated by von Graefe. In 60 per cent. of the above cases edema of the optic nerve was anatomically demonstrable.

Unpigmented Naevus of the Conjunctiva.

FOSTER, E. E. (*Klin. Monatsbt. f. Augenheilk.*, June, 1904.) The growth existed since birth in a girl, 13 years of age. Clinically it was a pale, yellow, reddish, smooth growth, imbedded in the conjunctiva bulbi near the limbus, and resembled a pinguecula. A malformation of the auricle and numerous naevi of the skin existed in the same side of the body. The histologic structure was typical for naevus: subepithelial cell heaps and nests (so-called naevus cells) were present, besides many epithelial finger-like projections partly cystic.

The cases of benign epitheliomata or dermo-epitheliomata or cystic dermo-epitheliomata, bear a striking resemblance to naevi.

In proportion as the naevi cells or the epithelial prolongations proliferate more the tumor will bear a stronger resemblance to naevi or epitheliomata. The various and conflicting views of the histogenetic structure of naevi of general pathologists and dermatologists are enumerated. Neither is there a general accepted opinion among ophthalmologists. Hirsch and Pindikowski believe that naevus cells take their origin from the conjunctival epithelium, which Wintersteiner and Stoewer could never corroborate. Fuchs is of their opinion, contending that naevus cells originate from the mesoderm and that sarcomata only develop from them.

In the above cases there are no indications that the naevus cells have any connection with the conjunctival epithelium, but they seem to have taken their origin from bloodvessels and lymphatics, but not from other connective tissue or chromatophores. That the cystic formation in the epithelial prolongations were to be ascribed to an origin from glandular structures could not be proven.

The Armed Probe.

QURIN, A. (*Klin. Monatsbl. f. Augenheilk.*, June, 1904.) A sound, consisting of a silver wire 8-10 cm. long and 0.2 to 0.4 mm. thick, is dipped in some melted nitrate of silver until 5 mm. of its tip is covered by a layer of the agent as thin as paper. A number of probes so prepared are kept in reagent tubes for future use. The special advantages gained over the stick and a 2 per cent. solution are: The possibility to accurately control the dose and the beneficial effects, the preservation of the surrounding tissues, if the focus of disease be ever so small, in the penetrating effect, in its sterility,

It has been employed for years in Pagenstecher's clinic for treating the minute ulcers in blepharitis ulcerosa and the excoriations of the external canthus, fistula of the lacrymal sac, in corneal fistula and keratitis vesiculosa, touching the raw surface of the cornea after a pterygium operation to prevent a recurrence, and cauterizing a milium after it has been opened with the point of a knife.

Experimental Research for the Pathogenesis of the Visual Disturbances in Quinine Intoxications.

ALTLAND, W. (*Klin. Monatsbl. f. Augenheilk.*, July, 1904), examined 4 cats, 3 rabbits and 3 dogs. The first group of animals was intoxicated by the employment of larger doses administered but once, while others, or the second series, were given repeated medium doses.

The microscopic changes in the ganglion cells of the retina received especial attention. The retinal ganglion cells of the animals of the first group showed a hypercolorisation and a slight chromatolysis, if no ischemia and visual disturbances remain; alterations in the ganglion cells are not discoverable. The transitory blindness in these cases might be explained by these histologic alterations, provided the nuclei remain intact. In the second series of animals the protoplasm of the cells was destroyed, the nuclei were in various stages of degeneration, in fact in many instances nothing remained of the cells but homogeneous clumps, which could never resume their function, and would be ultimately resorbed. The ischemia alone can not be held responsible for the changes in the retinal ganglion cells, but, in conjunction with the action of the poison, it has a deleterious action. Whether the retinal

ischemia is produced by a spasm of the blood-vessel walls or on account of the diminished heart-action, is an open question. The entire optic nerve of one animal presented evidences of degeneration.

Retinitis Punctata Albescens.

QURIN, A. (*Klin. Monatsbl. f. Augenheilk.*, July, 1904.) Of the few published cases of this interesting condition none could be examined anatomically; consequently all our present knowledge is founded on mere clinical observation. The patient, a girl, 18 years of age, had one brother who died at the age of 8 years with diphtheria and has one 14 years of age, perfectly healthy. Hemeralopia was present, central vision as well as the ability of orientation suffered severely in diminished illumination. Central vision in daylight and the visual field may be normal. In this instance the visual field was contracted above and as usual in this case the contraction was greater with diminished illumination. The ophthalmoscope revealed innumerable small yellowish or greyish white foci scattered about the papilla and along the course of the bloodvessels over which they never lie. To quote Pagenstecher, the process is a drusen formation in the glassy membrane of the chorioid. This affection leaves a conspicuous resemblance to pigmentary degeneration of the retina in the consanguinity of the parents, the hemeralopia, and the foci in the retina along the course of the blood-vessels. They differ from each other in that the pigmentary changes in the retina, with a bone-corpuscle like appearance, lie in the periphery of the fundus and in years eventually affect the central portions of the retina, while the yellowish white foci lie about the papilla and along the course of the retinal blood-vessels, leaving the macular region and the periphery of the fundus free. The progress and clinical outcome of retinitis punctata albescens is still shrouded in obscurity.

Persistent Medullary Nerve-Fibers of the Papilla of the Optic Nerve.

GILBERT, Asst. Royal Eye Clinic of Bonn. (*Klin. Monatsbl. f. Augenheilkunde*, August, 1904.) A Jew, 49 years of age, presented this condition in both eyes. The optic disc was hidden from view in both fundi by the medullary nerve fibres, which far overlapped its boundary. Some ob-

servers have noticed that some nerve fibers retain their medullary sheath in their passage through the lamina cribrosa and the scleral ring. Eversbusch avers that the lamina is imperfectly developed in these instances, basing his opinion on clinical observation, so far not verified by anatomical proof. The patient's vision in each eye was only 2 per cent., which may be accounted for by assuming minute congenital anomalies in the macula, invisible by ophthalmoscopic examination.

A Case of Melanosarcoma of the Lower Eyelid.

ENSLIN, EDWARD., 1st Asst. in the Eye Clinic of Erlangen. (*Klinische Monatsbl. für Augenheilkunde*, August, 1904) About 17 cases of this interesting and rare affection have been collected by the essayist. A woman, 60 years of age, developed a brown tumor on the lower left eyelid, 6 to 7 mm. thick. The patient had received a severe blow on this eye three months before the appearance of the tumor. Trauma has been a favorite theme for the explanation of these neoplasms. The patient had a congenital pigmented naevus in the palpebral conjunctiva, from which the tumor took its origin. This could be confirmed by the microscopical examination, which showed that the sarcoma developed from the subconjunctival connective tissue. Mention is made in dealing with the prognosis of these cases, of the great liability to recurrences and fatalities by metastases.

REPORT OF THE SECTION ON OPHTHALMOLOGY
AMERICAN MEDICAL ASSOCIATION, FIFTY-
FIFTH ANNUAL MEETING, HELD AT
ATLANTIC CITY, N. J., JUNE
7th to 10th, 1904.*

(Concluded from July No.)

THIRD SESSION.

Some Injuries of the Eye In Their Medicolegal Aspect.

JOHN J. KYLE (Indianapolis) read this paper, beginning with a classification of the various injuries and considering the several dangers, especially infection and sympathetic ophthalmia. A diagram was presented to illustrate these several points. He remarked the necessity of differential diagnosis between forms of blindness due to concussion of the brain, hysteria, and other similar conditions and gave several diagnostic signs of importance. Two cases of injury to the eyeball were then cited, one in which the traumatism was direct and the other indirect. In the first case the injury was due to a large particle of iron which penetrated the posterior chamber. A small magnet was used for its extraction. The reader then discussed the relative merits and advantages of the large and small magnets. The case of indirect injury was one of traumatic origin without evidence of any destruction of the ocular tissue, resulting in temporary blindness. A damage suit resulted. The various means of arriving at an estimation of the damages in such cases were then carefully gone over and the medicolegal aspect thoroughly discussed. He stated that the facts of the case were often obscured by the attorneys on both sides and remarked the necessity of having to frequently suppress a large part of the clinical histories in courts of law. His instructions to the expert witness under such circumstances would be to answer questions briefly without volunteering any unasked for information.

*From American Medicine.

Discussion.—H. M. STARKEY (Chicago) referred especially to function blindness, especially those cases of persons applying for pensions. When he saw no physical reason for blindness he gave the diagnosis accordingly. He then mentioned a few cases of injury in which sight was markedly affected from the indirect results of the traumatism, especially hemorrhage into the vitreous. J. L. THOMPSON (Indianapolis) also briefly discussed the question of traumatic blindness. H. V. WURDEMAN (Milwaukee) stated that the judge in damage suits for ocular injury should not be confined entirely to the cause of the particular lesion in any case, but to the effect it would have on the earning capacity of the individual. The expert should, if possible, plainly demonstrate the nature of the condition. He then referred to some decisions and awards in cases of this character to show the wide range that exists in awarding damages. He thought that the expert should testify as to the permanent results to the patient, and remarked the probability of the patient claiming damages from the attending physician. E. JACKSON (Denver) contributed some valuable thoughts as regards simulated blindness after injury, and believed the prism test of Priestley Smith, which took into consideration the movement of the eyes and not diplopia, was perhaps the best. In the performance of this test in the presence of binocular vision there is movement of the eyes to overcome prisms, 8 degrees to 10 degrees bases out. In hysteric blindness the eye movements may be inhibited and nullify this test. In closing the discussion KYLE voiced Wurdemann's remarks, and cited another case to illustrate the character of legal conclusions of a patient in whom deafness followed ear injury, and in whom there previously existed a ruptured tympanum to which in the trial the deafness was attributed by the defense.

Blindness and Oculomotor Palsies from Injuries Apparently not Involving the Optic or Oculomotor Nerves.

ALVIN A. HUBBELL (Buffalo, N. Y.) presented a paper with this title containing detailed reports of ten cases of injuries about the head and face apparently not implicating the optic or oculomotor nerves, in which blindness or palsy of the ocular muscles followed. He carefully discussed the subject

of reflex blindness and reflex paralysis and referred to the theory of Berlin and his followers, who believe that in these cases there exists a fracture of the sphenoid bone at the optic foramen or other similar direct injury. The reader defended the reflex theory as the one that most reasonably with our present knowledge explained the loss of function of the nerves of special sense and of motion in certain cases of remote injury.

Discussion.—S. D. RISLEY (Philadelphia) did not accept the reflex origin of blindness in these cases and mentioned the histories of several cases in support of this belief. He was inclined to think that in many of these cases there was injury to the optic nerve produced by force transmitted along the bony walls of the orbit. G. E. DESCHWEINITZ rejected the reflex origin of the visual and motor effects of these injury cases, and thought they could be more easily explained by considering the possibility of hemorrhage into the sheath of the nerve, infection of the orbital tissues, and vasomotor changes affecting the ganglion cells of the retina, ultimately inducing ascending optic atrophy. In closing the discussion, KYLE still defended the reflex theory, and said he would accept the fracture theory if clinical observations warranted it, particularly in involvement of the fifth nerve.

The Ocular Symptoms of Lesions of the Optic Chiasm.

G. E. DESCHWEINITZ and JOHN T. CARPENTER (Philadelphia) presented this paper, the principal features of which may be briefly summed up as follows: I. Review of present views of the structure and anatomic relations of the optic chiasm. II. Summary of the ocular symptoms of chiasm disease. 1. Anomalies of the visual field; (a) complete bi-temporal hemianopsia; (b) temporal hemianopsia of one eye and complete blindness of the opposite eye; (c) bitemporal achromatopsia with central scotoma for colors; (d) central scotomas; (e) irregular losses in the visual field; (f) unilateral nasal hemianopsia followed by progressive loss of the visual field; (g) binasal hemianopsia. 2. Ophthalmoscopic changes; (a) optic neuritis; (b) optic nerve atrophy without preceding neuritis; (c) alterations in the general eyeground. 3. Anomalies of the external ocular muscles. 4. Alterations in the pupil reflexes with special reference to the hemiopic pupillary inaction. III. A consideration of the lesions which

may produce alteration in the structure and function of the chiasm; for example: New growths springing from the body of the sphenoid bone; fracture of the body of the sphenoid; basal tuberculous, and syphilitic lesions; chronic thickening of the dura mater near the chiasm; vascular disease in the neighborhood of the chiasm; invasion of the chiasm by distension of the infundibulum of the third ventricle in internal hydrocephalus; tumors of the cerebellum and closure of the aqueduct of Sylvius; lesions of the chiasm in disseminated sclerosis. IV. Diseases of the pituitary body, especially akromegaly. V. Simulation of chiasm disease by other affections, as hysteria, locomotor ataxia, brain tumors, etc. VI. Lesions of the chiasm occurring under the influence of certain toxic agents.

Discussion.—CASEY A. WOOD (Chicago) briefly referred to congenital anomalies of the chiasm, and stated that it might be probable that they were the cause in some cases in which there was an aversion to binocular single vision, even after the muscle balance had been restored by muscle operations. He also made mention of the necessity of studying these cases postmortem. JOHN D. CARPENTER (Philadelphia) considered Wood's suggestion, and thought it could be best carried out in a general hospital. CLARENCE VEASEY (Philadelphia) exhibited a skiagraph, showing the shadow of a neoplasm of the chiasm, and alluded to a few other similar cases. L. J. BORSCH (Philadelphia) spoke in reference to the uncertainty of prognosis, citing a case in which an unfavorable prognosis was given. Recovery with marked improvement in vision, occurred after the employment of specific treatment. G. A. ASCHMANN (Wheeling, W. Va.) related the history of a case in which sarcoma of the chiasm and tobacco amblyopia existed at the same time, and urged the necessity of most careful differential diagnosis. F. B. TIFFANY (Kansas City, Mo.) gave an account of a case with contracted fields and hemianopsia, the cause of which he believed to be located in the chiasm. C. R. HOLMES (Cincinnati) related a case with loss of vision of obscure origin, which at autopsy revealed latent purulent inflammation, with necrosis of the sphenoid not evident by examination of the nasal cavities. A clot was found resting on the chiasm and sella Turcica, and the bone was found eroded. The loss of vision was, no doubt, due to irritation

of the optic nerve by the inflammation, and death was induced by the hemorrhage. J. E. WEEKS (New York) inquired for an explanation why choked disc was not more frequently encountered in these cases. In closing the discussion, Dr. SCHWEINITZ complimented his associate, Carpenter, for his untiring efforts in the preparation of the paper. He stated, in reply to Weeks, that only two cases of choked disc were observed in 100 collected cases, but gave no explanation. In considering differential diagnosis, he referred to functional visual disturbances simulating chiasm disease, and further stated that in no other affections than chiasm disease was it possible to have permanent bitemporal hemianopsia.

Contraction of the Visual Fields as a Symptom of Anesthesia of the Retina.

L. WEBSTER FOX (Philadelphia) read this paper, giving the histories of 24 cases of children between the ages of 8 and 16 years, in whom loss of vision with contraction of the visual fields occurred without other subjective or objective symptoms. The application of the constant electric current from three to five times served to bring about a restoration to normal. In only one case was there a recurrence. The eyegrounds were normal in every respect, and the patients were in good physical condition. The essayist was convinced that the affection was not hysteric in nature, since there were no scotomas, inversion of the color fields or any of the concomitant symptoms of hysteria. He did not consider eyestrain as the etiologic factor, as several of the patients recovered with the electric treatment without wearing the correcting lenses. The ametropia was determined in every case, but frequently the correction accepted, while the fields were small, was rejected when they again became full. He believed this observation to be original with him, but quoted two cases that closely approached his case in their histories. The affection, in his opinion, was due to fatigue and exhaustion of the retina, brought on in all probability by mental overwork in school. He included it under the class of affections known as retinal anesthesia, for want of a better term.

Discussion.—W. L. PYLE (Philadelphia) stated he had often observed these cases of diminution of vision in children, but the contraction of the visual fields had escaped his atten-

tion. He attributed it to eyestrain. In young children nutritional and functional disorders were the causes while in older children overwork was the factor. He referred to the cases of Fox, which he had observed and believed that the condition was one of reflex inhibition or perverted sensation from eyestrain. The benefit derived from the electric current was brought about by a redirection of the nerve impulses in his opinion. He also thought that a careful examination of the refraction, especially a consideration of the astigmatic changes, was most valuable. E. E. HOLT (Portland, Maine) had observed several somewhat similar cases. The electric treatment was curable and there were no relapses. He believed the cases to be due to overwork. G. E. DESCHWEINITZ objected to the term anesthesia and believed that Fox had satisfactorily eliminated the element of hysteria and that the affection was entitled to some other designation. He could not, however, see how the affection differed from neurasthenic asthenopia of Wilbrand's type and inquired whether he found abnormal contraction of color fields or scotoma. He mentioned that these fields differed from hysteric color fields which remained permanently contracted until the affection was relieved. In closing the discussion Fox again emphasized the lack of evidence to associate the condition he described with hysteria or eyestrain.

Syphiloma of the Ciliary Body.

H. KNAPP (New York City) read this paper and illustrated the same. He stated that he believed these cases not to be as hopeless as generally supposed and quoted a case in which the diagnosis of iritis serosa was made and the treatment instituted accordingly. At a later period a history of syphilis at a remote period was obtained and the patient was placed on inunctions. A typical feature in this, as in other cases, was the swelling of the upper part of the ciliary region extending upward and to the temporal region. In the early stage it pursued a course similar to iritis and the swelling was about 3 mm. to 4 mm. high and 6 mm. to 8 mm. long and extended around the corneal margin. The tension was alternately high and low. There was not very great pain. Continuation of the constitutional treatment brought about an abatement of the symptoms. While apparently hopeless, he stated that sympathetic ophthalmia was not to be feared

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up the question of typhloema in negroes, and believed that the result here could be attributed to the patient's negligence in the care of the disease. RANDOLPH (Baltimore) mentioned a case occurring in a white man similar to the cases of Bur-
nett in which the growth was diagnosed as sarcoma by a phy-
sician, and an unfavorable prognosis and the internal ad-
ministration of potassium iodid, with beneficial results. He
then gave some points for differential diag-
nosis. H. KNAPP laid great stress on the occurrence of a dark color involving the
ciliary body. In the case of typhloema was largely confined to
the ciliary body, and without inflam-

tory symptoms. In syphilomas there is sympathetic ophthalmia. Being constitutional, it may be bilateral.

G. E. DESCHWEINITZ announced the opening of the new laboratories of the University of Pennsylvania, on Friday, June 10, 1904, and as a member of the University committee, extended a special invitation to the section to be present.

Temporal Cleft of the Nerve Head and the Other Fundus Anomalies often Present with It.

CHARLES H. BEARD (Chicago), in a paper with this title, reported a series of observations concerning a hitherto undescribed appearance of the optic nerve entrance, particularly as regards the arrangement of the nerve fibers and that of the bloodvessels of the retina. He mentioned especially the whitish crescent occurring on the nasal side of the disc, often crossed by vessels and applied the term "morning-glory nerve head" to this condition. Various anomalies and anastomoses of the arterial supply were considered, as was also torsion of the eyeground toward the temporal side, with no evidences of imperfect closure of the fetal cleft elsewhere occurring in these cases. He had noticed the prevalence of errors of refraction on the side having the defect. He believed it was not a true coloboma, but as Ginsberg had observed, an anomalous condition due to an imperforate lamina cribrosa. The essayist stated he had on more than one occasion observed it in two members of the same family. Attention was also called to certain physiopathologic features of the chorioid that accompanied the condition in question that were partly congenital and partly acquired. The attendant functional abnormalities were detailed, among which was a striking peculiarity relative to the physiologic blind spot. Numerous colored drawings and charts were projected on the screen to illustrate the paper.

Discussion.—G. E. DESCHWEINITZ congratulated Beard on the originality of the observations contained in his paper. He did not know whether or not these changes were associated with any abnormal mentality, and ventured the query as to whether or not they belonged among the stigmas of degeneration. BROWN (Minneapolis) discussed the paper and expressed a doubt as to whether the physiologic cup was not pathologic when the eccentric fields were altered. In closing the discussion, BEARD mentioned that there were no struc-

tural changes indicative of imperfect closure of the cleft in his cases. Strabismus and nystagmus were observed. The eye with the cleft in the nerve head usually possessed a high error of refraction. In none of his cases were there any evidences of disordered mentality or stigmas of degeneration. He brought up the subject of the powder grain fundus and showed that where there was a thin chorioid a wider physiologic excavation was present. Diminished light sense was present in these cases.

Obstruction in the Retinal Arteries.

ALLEN GREENWOOD (Boston) in presenting this paper stated that the most frequent causes were arteriosclerosis, embolism, spasm; most frequent is arterial disease. Arteriosclerosis of retinal arteries was often not recognized early. Later stages produce "degenerative albuminuric retinitis." Most cases follow general arteriosclerosis and are to be distinguished from inflammatory retinitis due to uremic poisoning. He insisted that it was important that this be recognized early, for treatment would add to comfort and length of life. Complications to be delayed are sclerosis of vessels of brain and kidneys. Ophthalmoscopic examination of elderly patients often reveals early arterial changes years before involvement of kidneys becomes apparent. Embolus is usually a dislodged fragment of a diseased heart valve. Treatment must be early to cause it to pass into a smaller and more peripherally situated vessel in time to restore retinal function. Many cases of so-called embolism probably result from sudden closure of a retinal artery nearly obstructed by endarteritis, closure being due to spasm or lowering of blood-pressure. Spasm as the cause of attacks of sudden temporary blindness is now an accepted fact. It usually occurs in retinal arteries, the seat of endarteritis, and these two conditions may lead to blindness. In treatment it was essential that the patients should live moderately in every respect, being careful to constantly maintain proper elimination, the details of the treatment to suit the requirements of each individual case. Potassium iodid was advised and amyl nitrite was recommended to avoid spasms of the vessels.

Discussion.—J. E. WEEKS (New York City) demonstrated that certain conditions, especially perivascularitis, showed changes analogous to arteriosclerosis. The white line in these

was uniform. In atrophy of the vessels the white line in these was appreciable, the caliber was uniformly diminished, and anemia was present. In arteriosclerosis the narrowing was irregular and nodular in type. The small vessels, he believed, were usually affected in spasm. Embolus sometimes occurred in connection with arteriosclerosis. He also referred to the red spot in embolism and thrombosis, and to the possibility of having obstruction with macular changes without albuminuria. In closing the discussion Greenwood remarked that while macular changes did occur without albuminuria, renal changes ultimately followed, and that two varieties of retinal arteriosclerosis should be recognized, that preceding and that accompanying or following renal disease.

Development of the Faculty of Binocular Vision.

EDWARD JACKSON (Denver) in this paper remarked that the fusion faculty, a highly specialized power of co-ordination, is probably developed slowly, but only during childhood, it being extremely difficult or impossible to develop it during adult life. He also stated that calling attention to the possibilities of fusion may induce the child to practise it habitually, if favorable conditions are supplied. The weak point in the usual methods of training is the limited range of objects on which the fusion faculty can be exercised and the small proportion of time that the training could be continued. He then presented an instrument which was adapted for all objects without special preparation, and all acts of vision. The instrument makes use of the principle of lateral inversion of images formed in mirrors; it consists of two inclined mirrors, one of which can be rotated; the images formed in the mirrors are viewed through a hole in the back of the appliance. It should be placed before the deviating eye. Smoked lenses may be placed before the opening to make the existing diplopia manifest. By a special contrivance of a head band the appliance can be worn constantly.

Discussion.—WENDELL REBER (Philadelphia) referred to the study of binocular vision in adults in whom there was no vision until full grown. He believed that the instrument might be applicable in cases such as the celebrated case of congenital cataract of Trombetta in developing binocular single vision. He also spoke of the possibility of chiasm growth as a cause of defective fusion faculty, and believed

that strabismus might be regarded as a reversion of type. CASEY A. WOOD (Chicago) inquired into the expense of the apparatus, believing from its appearance it might be more expensive than other similar devices. In closing the discussion, JACKSON referred to the case quoted by Reber, and to Miner's case, and spoke of developing fusion by educative measures. He also remarked that it was a common observation to have fusion developed after the correction of high degrees of ametropia. H. KNAPP (New York City) also discussed this paper.

The Usefulness of the Ophthalmometer.

F. C. HEATH (Indianapolis) in this paper brought out the question as to whether the ophthalmometer was of any practical use in refraction work, and to prove its value cited briefly three cases, types of many others seen in everyday practice. He also related additional cases tending to show whether or not it obviated the necessity of mydriatics. The essayist in addition took up the subject of its infallibility and its limitations, and compared it with other methods of measuring refraction. He concluded that it was the surest way of measuring corneal astigmatism, but should be combined with other methods. When mydriatics were refused by the patient it was undoubtedly the most accurate method. It was the most useful corneal instrument, but did not do away entirely with the use of mydriatics, and while not infallible, had but few failures when properly used.

Discussion.—H. KNAPP (New York City) opened the discussion referring to the first attempt to determine lenticular astigmatism by Thomas Young. W. REBER (Philadelphia) was not very enthusiastic about the instrument, although he uses it routinely. He preferred retinoscopy. He believed the most valuable evidence of astigmatism given by the ophthalmometer was its negative evidence. RAY (Louisville, Ky) thought it of great aid in detecting astigmatism, and especially in determining its axis. C. F. CLARK (Columbus, Ohio) employed the instrument in the same manner as Reber, and asked for an explanation of those cases of astigmatism following cataract extraction, in which the results of the ophthalmometer did not correspond with the findings by means of the test lenses. E. JACKSON stated that the scale of the ophthalmometer was gauged only for the complete eye, and indicated

merely the curvature between two given points. He said the center may differ from the entire curve from margin to margin. He employs the instrument routinely, but does not depend on it. In closing the discussion, HEATH stated to the effect that, while it could not be relied upon, he obtained good results in about 75 per cent of cases of astigmatism.

Some Problems of Presbyopia.

GEORGE M. GOULD (Philadelphia) in this paper, presented 15 statements, with explanatory additions, based on an extended experience as follows: 1. In oncoming presbyopia, cycloplegia generally is necessary to obtain the static refraction on which the presbyopia is based. Personally he employs homatropin and cocain up to the age of 55 years, or even 60 years, if necessary, avoiding them if there is any tendency to glaucoma. 2. Age at which correction should first be given depends on the pre-existing refractive error. 3. Correction of error often depends on amblyopia from disease. 4. Less accommodation may condition the amount of presbyopic error. 5. Onset of presbyopia may be delayed by hypertrophied accommodation. 6. Age of correction of presbyopia and degree of error depend on amount of near work. 7. Presbyopes who misstate age may suffer if oculist does not detect the error. 8. Occupation may necessitate higher and earlier correction than usual. 9. Quality and power of light must be considered. 10. Position of body and head in near work may be harmful. 11. Effect of general health, vitality, vigor of will and of body. 12. Failure to cure reflexes of eyestrain may be due to want of bifocals. 13. Eyeglasses being more prone to maladjustment than spectacles may cause failure to relieve symptoms of sequels of eyestrain. 14. Premature presbyopia possible years before usual age may explain failure to relieve symptoms when none of the preceding causes will do so. 15. Systemic disease and not presbyopia or eyestrain may cause symptoms. He cautioned against having fixed rules in this condition, and of relying upon optical machines.

Discussion.—R. A. RANDOLPH (Baltimore), in opening the discussion, stated that cycloplegia was frequently necessary in early presbyopia, and that he frequently employed the same, giving preference to the homatropin and cocain discs. He did not, however, use it the same as in younger individuals. He

prevents any possibility of glaucoma by the instillation of from one to two drops of eserine. G. C. SAVAGE (Nashville, Tenn.) referred to the difference between a strong and weak ciliary muscle and the relation of each to convergence. He said he tested the strength of the muscle by its ability to overcome high convex lenses. A weak ciliary muscle means early presbyopia and demands strong cerebral impulse and induces spasm. He also remarked of the differences in the muscle balance for distance and for near work. He related a case of a young girl 28 years of age in which a weak ciliary muscle in an attempt to overcome failing accommodation induced spasm of convergence, which was relieved by wearing one-half the presbyopic correction. In his opinion the early correction of hyperopia would prevent premature presbyopia. H. KNAPP (New York City) recommended bifocals in presbyopia and mentioned their several advantages. He routinely examines for failing accommodation and believes the whole trouble to be in the condition of the refraction and not in the muscles. M. STEPHENSON (Akron, O.) said he used homatropin in these cases in albolene, instilled with the patient in a dark room, following it in persons over 45 years of age with eserine. In many uncorrected myopes he thought there was often presbyopia, and stated that frequently in such cases the correction relieved the muscles and in this way defeated the purpose of stimulating convergence. In prescribing glasses the vocation of the patient should be considered. He saw no objection to nose glasses when properly fitted and remarked that the oculist often had no choice in this matter. They should be adjusted at frequent intervals. W. L. PYLE (Philadelphia) referred to the early impressions made on him by Burnett and Gould as regards the necessity of cycloplegia in early presbyopia. He cited a case of glaucoma following the instillation of homatropin and cocaine, in which recovery followed a posterior sclerotomy, but said this did not deter him continuing cycloplegics in early presbyopia. He believed the invariable use of eserine after the cycloplegic would prevent glaucoma. VALK (New York City) said he did not use cycloplegics after the age of 45 years. In prescribing lenses he was influenced greatly by the nature of the patient's occupation. J. S. KIRKENDALL (Ithaca, N. Y.) thought early presbyopia in myopia was apparent and not real. J. L. THOMPSON (Indianapolis) said he had used homatropin in

some cases as old as 50 years, but always follows it with eserin. He believed atropin to be dangerous in these cases. The disappearance of low degrees of astigmatism under cycloplegia was remarked. The necessity of gauging the correcting lenses by the situation of the near point was dwelt upon on account of the uncertainty of the ages especially in females. He spoke of the various kinds of glasses indicated and said he believed Gould exaggerated the question of migraine, relating several instances in which it was due to other causes, especially reflection of the sun's rays. Apart from this, he thought Gould's ideas were correct. In closing the discussion, GOULD gave the proportions of homatropin and cocain he employed and when followed by three or four instillations of eserin (2 gr. to the ounce) it was possible to restore the accommodation in 15 minutes. He recommended the invariable instillation of this drug in these cases. He failed to see how Valk could correct presbyopia after 40 years without a cycloplegic, without failing to recognize low degrees of astigmatism and other forms of ametropia. The various ill-effects of astigmatism were then given.

Symposium on Sympathetic Ophthalmia: Clinical and Histologic Observations on Sympathetic Ophthalmia.

CLARENCE A. VEASEY (Philadelphia) briefly referred to some of the points in therapeutics in previously published papers, and gave the histories of two of his own cases. In one, the sympathetic disease appeared eight years after the primary injury by a piece of glass, which remained inside of the eye during this period; in the other, the sympathetic affection became manifest in four weeks after the primary injury. The exciting eye was enucleated. Various forms of treatment were employed to combat the sympathetic disease, none of which were attended with success except the administration of large doses of salicylate of soda. In the first case the salicylate was withheld on several occasions, and the symptoms returned. Recovery with useful vision ultimately occurred. A histologic study of the enucleated eyes showed areas of degeneration in a cross section of the optic nerve, which were probably due to the passage of toxins. Cultures taken from the eye showed staphylococci, which organisms were also found in the nerve sheath. He emphasized the

necessity of taking the vision daily in all these cases in order to carefully follow the progress of the disease.

Sympathetic Ophthalmitis.

SAMUEL THEOBALD (Baltimore) briefly reviewed the various theories as to the genesis of sympathetic ophthalmitis. Thirty years ago there was but one view held as to the genesis of sympathetic ophthalmitis—that it was the result of a reflex irritation transmitted from the primary to the secondary eye through the ciliary nerves. Notwithstanding the convincing evidence in favor of this view it soon came to having but few adherents, because it conflicted with the teaching of modern pathology that inflammation cannot be produced by an irritation transmitted through a sensory nerve. The theories which have since been advanced—the progressive optic neuritis theory advocated by Alt, and the septic theories of Leber, Snellen, and Berlin—rest on no substantial basis. The carefully conducted experiments of Head and Campbell regarding the pathology of herpes zoster, which show that bacteria take no part in either the ganglion or secondary skin lesions, and that the latter are the result of “intense irritation of cells in the ganglion which normally subserve the function of pain,” seem to dispose of the only serious objection which has ever been urged to the ciliary nerve or reflex theory of sympathetic ophthalmitis, and bring this theory, which so satisfactorily explains the clinical phenomena of the disease, once more to the forefront. He concluded that there existed a definite relation between herpes zoster ophthalmicus, monocular ophthalmia, malarial keratitis, iridokeratitis, monocular exudative choroiditis, serous iritis, and other affections and the ganglia of the eye, especially the ophthalmic ganglion.

Operative Procedures on the Exciting Eye and the Sympathizing Eye in Cases of Sympathetic Ophthalmia.

JOHN E. WEEKS (New York City) cited cases of the disease and the operative procedures he employed in each, classifying them as follows; 1. Cases in which the exciting eye still preserves vision, the sympathizing eye being in the early stage of sympathetic ophthalmia. Mercury, salicylates and potassium iodid were administered and iridectomy performed. 2. Cases in which the sympathizing eye has become quiet, with almost complete posterior synechia, pupil occlu-

ded, vision, perception of light, projection good, tension normal or slightly below normal, the exciting eye not a factor. In a case of this character he performed a broad iridectomy upward on the injured eye and later attempted to clear the pupillary area of a pseudomembrane. 3. Cases in which cataract has formed in the sympathizing eye: posterior synechias; eye quiet; projection good; the exciting eye not a factor. Iridectomy was performed in one of these cases by a colleague; later a cataract extraction was done employing the conjunctival flap method. 4. Cases in which, with occluded pupil, total posterior synechia exists in the sympathizing eye. The tension is plus and increasing; projection still good; the inflammatory process in a subacute stage, the exciting eye not a factor. The sympathizing eye should be enucleated under such circumstances.

Discussion.—C. F. CLARK opened the discussion, remarking the value of a study of the histopathology of these cases. The benefit derived from the use of the salicylates in this disease, in syphilis, and in all forms of iritis, giving it until the patient was saturated with the drug, was greatly lauded. To obtain the best results from this treatment a course of calomel, followed by a saline, should precede it, and the patient should be placed at rest in bed and given a hot pack. Stimulants, especially strychnin, should be avoided. He quoted Gifford as being responsible for the introduction of the salicylate treatment in sympathetic disease. L. Connor (Detroit) reviewed the theories of the production of this disease, and believed that the presence of muscular tissue in the ciliary body caused its share, along with other muscles, in affections due to faulty eliminations of waste products, and advanced this as a possible explanation of the benefit derived from the salicylates. He said the bacteriologic theory was not conclusive, but that their toxins may be the cause. G. H. Williams (Baltimore) cited a case in which he had used salicylates with fairly good results, and referred to the enormous possibilities of radium in this and other affections involving the anterior segment of the eye. N. L. Wilson (Elizabeth, N. J.) uses saline injections and local treatment, which, if unattended by improvement, is followed by removal. If there is little or no sight, he thought enucleation should be performed. G. C. Savage (Nashville, Tenn.) did not believe in ciliary irritation as a cause, and cited two cases in which the

disease occurred after the enucleation of the exciting eye. He doubted the toxin theory, but believed the germ theory to be most accurate. The time necessary for the migration of the microorganisms varied. One case he observed in four weeks, and thought the time possibly depended on the nature of the infecting microorganism. He advised removal of a useless eye after four to six weeks, but cautioned against telling the patient he would be absolutely free from the disease after such a procedure. E. Jackson (Denver) referred to Brown Pusey's suggestion of last year. He accepted the nerve impulse theory, but thought there was some additional factor. The removal of the exciting eye always lessens the danger. He favored irrigation. Sutphen (Newark N. J.) spoke favorably of the salicylic compounds in all inflammatory cases. He had first used this treatment in glaucoma, but had never employed it in sympathetic ophthalmia. He gives 15 gr. every six hours in glycerin. The theory advanced by Theobald was supported and a case cited to prove the same. Thompson (Indianapolis) agreed with Theobald, but thought there were many causes of the disease to be considered. He cited one case in which the affection appeared 25 years after the receipt of the injury. Ayers (Cincinnati) related a case in which cataract occurred in sympathetic ophthalmia, which was later extracted. He favored delay in some cases. R. A. Randolph (Baltimore) related the experimental side of the question, and stated that the lower animals do not have sympathetic ophthalmia. He believed that experiments of this nature would not contribute much to the subject. In closing the discussion, Veasey expressed gratification at the discussion his paper had evoked, and referred to the salicylate treatment as an old treatment among his Philadelphia colleagues and predecessors. Theobald answered Savage, and attempted to refute the cytotoxin theory of Brown Pusey. He favored the use of the salicylates in all inflammations of the eye, and advised employing essence of pepsin as a vehicle, especially when giving large doses. Weeks said he would not retain the exciting eye, unless there was a possibility of vision being ultimately best in that organ. In his experience, removal of the exciting eye does not immediately stop the process, and often has not influenced it at all.

Methyl Alcohol Intoxication.

FRANK BULLER (Montreal, Canada) by special invitation read this paper dealing with the various features of this affection, remarking the ignorance of the public and legislators regarding the poison. The prominence of its ocular symptoms first brought it to the attention of ophthalmologists. He collected and briefly reviewed the histories of 51 reported cases, and described the various preparations in which the drug was to be found. He remarked the possibility of death in these cases without ocular symptoms, and deplored the widespread ignorance of the toxic properties of methyl alcohol among the profession as well as the laity. In reply to a circular letter sent to prominent ophthalmologists throughout the world, one man said he had never seen or even heard of a case of methyl alcohol intoxication with bad results. Buller observed that most of the cases (48) had occurred in the United States. Indulgence in ordinary alcoholic beverages does not lessen one's susceptibility to methyl alcohol. He considered methyl alcohol intoxication as of three grades: 1. That attended by mild gastrointestinal disturbance and mild intoxication, ending in recovery. 2. That accompanied by dizziness, marked gastric disturbance, with dimness of vision terminating in blindness. 3. That in which there is sudden overwhelming prostration, ending in coma and death. He had also observed that most of the victims were middle aged males, and that the condition was induced by a debauch, in which some cheap grade of liquor was drunk. The affection offered a great field for educating the public as to the nature of the drug, and the various names under which it appeared in trade. In the cases he had collected, recovery had occurred in only seven. Amblyopia usually began at the end of 24 hours. He referred to the custom of temperate individuals taking Jamaica ginger, bitters, etc., for various affections, and warned against the possible methyl alcohol poisoning in such cases. The occurrence of cirrhosis of the liver in northern Vermont among abstainers was also remarked. Casey A. Wood (Chicago) in a supplementary report gave an account of 91 hitherto unreported cases. In eight of these, blindness followed breathing of air contaminated with methyl alcohol fumes. In 62 cases death was not preceded by blindness.

He referred to the tendency on the part of the western Indians to drink red ink as a beverage and the resultant bad effects. The immunity enjoyed by some persons, especially certain druggists, to methyl alcohol, was mentioned. The most palatable form in which it appeared was Columbian spirits, after consuming which, out of eight persons, three will become blind, and three will die. The diagnosis is seldom difficult, except when other substances, such as quinin, are dissolved in the drug. The visual fields of methyl alcohol intoxication were shown; blotting out of the peripheral field and central scotomas were seen in typical cases. He thought that in all cases with central scotoma and gastrointestinal disturbances methyl alcohol intoxication should be suspected.

New Views Regarding the Horopter.

GEORGE T. STEVENS, (New York City) reviewed the various views regarding the horopter and made special reference to the doctrine of corresponding points exploited by Helmholtz. He eliminated some of the confusing points and demonstrated the true doctrine of corresponding points and of vertical meridians by means of mathematic formulas. The effects of certain normal adjustments of the eyes on the horopter were also shown. Reference was made to the clinoscope. Torsion was spoken of as a physiologic adjustment and declination as an abnormal adjustment of the retinal meridians.

Discussion.—G. C. Savage (Nashville, Tenn.) attempted to demonstrate the inaccuracy of these views by the diagram of an isogonal circle of Maddox. He also stated that he believed the Helmholtz theory of corresponding points to be the only correct one. He said the planes of monoscriptor circle were proofs of Helmholtz's theory. Referring to torsion, he showed that it and cyclophoria were identical and due to imbalance of the oblique muscles. In closing the discussion, Stevens, with reference to the horopter of Helmholtz and Müller, quoted Listing's law.

FIFTH SESSION.

Report of Chairman of Executive Committee on Nominations.

C. R. OLMES Cincinnati, for chairman; Walter L. Pyle,

Philadelphia, for secretary; Melville Black, Denver, for delegate to the House of Delegates, with Hiram Woods, Baltimore, as alternate, were presented for nomination. On motion, the secretary was directed to cast one vote for these members, and they were accordingly elected.

Brief Report of Two Additional Cases of Sympathectomy for Glaucoma.

W. H. MARPLE (New York City) gave the clinical histories of two cases in this paper. In the first, the disease was of the chronic simple form. Iridectomy had been performed in both eyes, but there was progressive failure of vision notwithstanding. Sympathectomy was performed and followed by some improvement. The second was one of acute inflammatory glaucoma. The other eye had been previously lost and a trial was made of sympathectomy, which, however, did not prevent recurrence of an acute attack subsequently. Hoarseness, constriction of the throat, and ptosis followed the operation although in other respects convalescence was uneventful. The essayist laid great stress on the prognostic value of the fields on account of the element of the optic atrophy which was not uncommonly associated with glaucoma. He believed that when the fields were concentrically contracted the prognosis from any form of operation was more grave than when the contraction was to the nasal side. From his observations he concluded that sympathectomy was not indicated in acute inflammatory glaucoma and that its only indication was in chronic simple glaucoma. He considered it a harmless procedure and that its results warranted suggesting it in hopeless cases.

Discussion.—W. H. Wilder (Chicago) referred to the cases previously reported by him and favored the performance of sympathectomy. He believed one was justified in performing it first in chronic glaucoma and later resorting to iridectomy in the event of its failure. J. Weeks (New York City) did not agree with Wilder. He performs sympathectomy only after iridectomy and sclerotomy fail. He related a case in which iridectomy was performed five times before the glaucoma was controlled. In closing the discussion Marple said that he did not see a very brilliant future for sympathectomy and that he preferred to perform it after failure of iridectomy.

The Environment and Visual Requirements of Railway Engineers and Firemen: Personal Observation from an Engine Cab.

NELSON M. BLACK (Milwaukee) in this paper noted the omission by most writers on this subject of any consideration of the environments and conditions under which the enginemen work. His remarks were based on personal observations made from an engine cab in all kinds of weather, at all times of the day and night in traveling over 3,000 miles of railroad. These observations were fully detailed and amply illustrated by photographs taken on the road. The various visible signals were described and also illustrated. Conditions interfering with the proper perception of the signals (with the standard of vision required) such as those existing about the engine, those due to atmospheric changes, and those caused by various reflecting surfaces were discussed. The central scotoma occurring in firemen from the glare of the firebox and its prevention by amber tinted glasses were noted. He incidentally remarked that the only way in which to determine the true visual perception for color, form, etc., was to examine the man at work. He advised in using the Holmgren's wools for color blindness, not to ask for the name, but to match the colors and in using the lantern test to ask the significance of colored light seen. The latter should be used only as a control test. As regards wearing of correcting lenses, he did not consider them a hindrance but would not advise retaining any employee on an engine with over one and a half diopters of ametropia. The essayist detailed the resolutions suggested by the Ophthalmic Section in 1901, the House of Delegates, in 1902, the American Academy of Railway Surgeons, 1903, and the American Ophthalmological Society, 1901, and noting more or less variance in these rules suggested the adoption of a uniform report as follows:

Section 1.—It is essential that railroad corporations should require definite and scientific examinations of the sight and hearing of those employees who will be at all concerned with active operating of trains, or in giving or receiving signals.

Sec. 2.—That a trained ophthalmic surgeon be selected by each company, who shall instruct and examine the men selected by the company to make these tests, shall recom-

mend the standards and methods to be used, shall see that the equipment furnished to each examiner is sufficient, that it is kept in proper order and renewed when necessary, and who shall be the authority to whom the doubtful cases shall be referred for final settlement.

Sec. 3.—That the hearing be tested by the spoken word of the examiner and by a watch or acoumeter, and that for entrance to the service a candidate be required to repeat correctly words or numbers spoken in an ordinary conversational tone at a distance of twenty feet; or, for examination, at a distance of ten feet.

Sec. 4.—The acuteness of vision should be tested by the test types of Professor Snellen, or those which conform to his standards, which should in all instances have the same intensity and source of illumination.

Sec. 5.—There should be two general standards of visual and aural requirements, viz., one for new men hoping to enter the service, and to be actively engaged in the operation of trains, and in giving and receiving signals; and one for those men engaged in similar work who have been uninterruptedly in a company's service for five years, either the company from which employment is sought, or some other company enforcing similar regulations. These latter may be regarded as old employes.

Sec. 6.—The following minimum requirements should be adopted for acuteness of vision:

CLASS A.

Enginemen (road service), firemen (road service):

Entrance to Service.—20/20 in each eye tested separately without glasses and shall not possess more than $1\frac{1}{2}$ D of apparent hypermetropia.

Reexamination of Those in the Service.—Enginemen shall not be retained in their positions if vision sinks below 20/40 in one eye and 20/30 in the other, or 20/20 in one eye and 20/50 in the other, unless such vision can be brought up to standard with glasses. Distance glasses must be worn when on duty, provided such glasses are necessary in order to bring vision up to the required standard. Firemen shall not be eligible for promotion to enginemen if vision sinks below 20/30 in either eye without glasses, and shall not be retained

as firemen if vision sinks below 20/40 in either eye without glasses.

CLASS B.

Passenger conductors, passenger baggagemasters, passenger brakemen, ticket collectors, freight brakemen, yard masters, yard conductors, yard brakemen, yard enginemen, yard firemen, switchmen, draw tenders, engine inspectors, car inspectors:

Entrance to Service.—20/20 in one eye and not less than 20/40 in the other. Tested separately without glasses. Glasses must be worn on duty if they improve vision.

Reexamination of Those in the Service.—Employees, shall not be retained in these positions if vision sinks below 20/40 in one and 20/30 in the other eye, or 20/20 in one eye and 20/50 in the other, unless such vision can be brought up to standard with glasses. Glasses must be worn if they are necessary to secure adequate vision.

CLASS C.

Towermen, telegraph operators, station agents, section foremen:

Entrance to Service.—20/20 in one eye and not less than 20/40 in the other. Tested separately with or without glasses.

Reexamination of Those in the Service.—Same as above.

CLASS D.

Crossing flagmen:

Entrance to Service.—20/40 with both eyes open, with or without glasses.

Reexamination of Those in the Service.—20/50 with both eyes open, with or without glasses.

Sec. 7.—The color perception should be tested by means of the colored worsteds of Professor Holmgren, preferably with worsteds tagged for the purpose of record; also, that in every case an additional test should be made with a lantern showing a number of colored lights, which can be varied in their size and intensity.

Sec. 8.—Reexamination should be made of all such employees every three years; and after any severe illness, or accident, or any occurrence which seems to cast doubt on the visual and aural capacity of the individual. Reexamination should also be made more frequently on men known to be excessive users of tobacco, or to be suffering from syphilis, albuminuria, diabetes, or acute or chronic eye or ear diseases. They should always be examined before promotion.

Sec. 9.—Men known to be excessive users of liquor should not receive employment for the services above designated (Section 5).

Sec. 10.—Written instructions should be furnished those making the examinations.

Discussion—Williams (Boston) thought that legislation in this particular was impracticable, as a new Legislature could repeal any laws made to govern this subject by the previous body. He showed that in the States in which it existed it was of little use. The lantern test he employs as a confirmatory test. He believed a high standard of requirements should be maintained for men entering the service. J. H. Claiborne (New York City) referred to the use of lights on ships, and suggested using white or blue in geometric figures, doing away with red and green. He thought there ought to be three men in the engine cab. Lambert thought the examination should be conducted by an ophthalmologist and not by a lay board, and that he should be allowed to exercise his own discretion in accepting men with reduced vision, especially when it was due to ametropia alone. Kirkendall (Ithaca, N. Y.) voiced an opinion that the lantern test was of value only as a confirmatory test. H. V. Würdemann (Milwaukee) believed that the lantern test should be used to confirm the wool test. The final test in examination of the refraction was the use to which the patient puts his eyes, and therefore the man should be examined at work on the train. He plead for legislation and uniformity in the rules and regulations. Todd (Minneapolis) brought up the subject of diplopia in these cases, relating the history of an engineman with perfect vision in each eye with occasional diplopia. Clark (Columbus, O.) urged making of tests for light sense, examining the patient in a dark room and having him count fingers. R. A. Randolph

(Baltimore) inquired about the illumination of the station shown in one of the photographs and its distance from the engine. In closing the discussion, Black returned to the subject of legislation. He also stated that he believed the man should be taught to recognize the lanterns as indicating danger, caution, clear, etc., and not as their colors. He emphasized the necessity of a high entrance standard. White as a signal color was objected to on account of the confusion arising between the lanterns and the city lights. Blue was undesirable, for the reason that the lenses could not be intensely illuminated with kerosene. He thought old employes disqualified for road work should be placed in less responsible positions. That men with errors of refraction were still of value, he demonstrated by reducing his own vision a half by lenses when on the train, and he was yet able to distinguish the signals at a distance of half a mile. He repeated the observation, that the men might fail on the work but pass on the lantern test.

(a) Some New Test Types for the Reading Distance: (b) An Improved Form of Apparatus for Testing the Position of the Axes of the Eyes.

CHAS. H. WILLIAMS (Boston). (a) One degree of visual angle between each size of type, numbered so the reading power can be noted, according to formula: $L=d/D$. L is reading power, d greatest distance in decimeters at which print is read, D is distance in decimeters at which the short lower case letters subtend a visual angle of five minutes (shown by numbers printed at each paragraph). Easy to make a quick record. (b) Vertical and horizontal arms holding electric lights controlled by a switch; three combinations: 1. Vertical red lines with horizontal green figures. 2. Horizontal red lines with vertical green figures. 3. Red lines and green figures in the same vertical line. Patient looks through spectacles with one red glass and one green. Looking at the apparatus in first or second positions; if he sees the red line at the zero point of the figures it shows there is no deviation right or left or up or down; if the red line comes over one of the figures the number shows the direction and amount of the deviation and the number of the prism needed to correct the deviation. In third position errors of rotation are shown.

The Association of Optic Neuritis and Facial Paralysis.

E. A. SHUMWAY (Philadelphia), in this paper briefly reviewed the subject of the associated optic neuritis and facial palsy and gave a complete clinical history of a case of right-sided facial palsy with double optic neuritis and followed by partial hemiatrophy of the face and exophthalmos. The essayist discussed the relation between the optic neuritis and facial palsies, and the sensory disturbances in facial paralysis and their consequences. He concluded that the neuritis was probably infectious in origin and retrobulbar in type.

Discussion — J. E. WEEKS (New York City), remarked about the unusual feature of exophthalmos. He cited a case of exophthalmos without optic neuritis or facial paralysis, but accompanied by partial hemiatrophy of the face and iris. In closing the discussion Shumway said his case could not be considered one of true hemiatrophy.

Blastomycosis of the Eyelid.

W. H. WILDER (Chicago) gave an account of this disease and related the history of a case. The gross and histologic changes were illustrated by means of the projector. He emphasized the exemption of the conjunctiva from the disease and the great tendency toward ectropion. The effect of the treatment by the use of potassium iodid internally, and the Röntgen ray locally was given.

Discussion. — W. A. PUSEY (Chicago, spoke of the subject from the standpoint of the dermatologist, but remarked the necessity of its recognition by the ophthalmologist owing to the great frequency with which it attacks the eyelid. He differentiated the disease from lupus, epithelioma, and tuberculosis verrucosa cutis and gave as the diagnostic feature the formation of miliary abscesses. The cause he accredited to a group of fungi, the oidii. Histologically, the fungi and miliary suppurative points were to be found in the mucous layer of the skin. General infection followed by death had been reported. The great tendency of the disease to occur in the middle West was especially noted. Elliott showed a slide of a suspicious case for which he desired a diagnosis, but Pusey withheld any opinion. Wilder, in closing the discussion, remarked that the prognosis was not bad except in systemic cases, and stated that potassium iodid and the Röntgen ray were beneficial and often operation was of value.

The Axis of Astigmatism.

J. H. CLAIBORNE (New York City), in reviewing the histories of a large number of cases, used the expression, "axis of astigmatism," synonymously with the axis of the cylindric glass. He preferred the index of the commonly used spectacle frame, with the circle divided in half, and zero marking the horizontal axis to the left in each eye. He believed in the absence of catastrophism in the axis of astigmatism and that hypermetropic astigmatism is an arrest of development and myopic astigmatism an over-development. That the axis does not occur haphazard, but along well-defined lines of regularity was also shown, the exceptions proving the rule. That there is a realm of hypermetropic astigmatism and a realm of myopic astigmatism in which the axes recur, was likewise demonstrated; when they lie outside of these realms it is exceptional. Demonstration of the realm in each condition was given. The relationship of the axes occurring in each eye to the axes in the fellow eye and the various possible combinations were given.

The Relation of Corneal Curvatures to the Refraction of the Eye.

MELVILLE BLACK (Denver), in this paper, demonstrated a study of the radii of corneal curvatures of 2092 meridians. Measurements were made in millimeters with the ophthalmometer of Chambers, Inskeep & Co. Two tables were presented which show 1,273 meridians to be hypermetropic in refraction, 509 myopic, and 312 ametropic. These tables showed a very striking relation between the refraction of the eye and corneal curvatures. As the radius of corneal curvature increases, the refraction becomes more hypermetropic, and as the corneal radius diminishes the refraction becomes more myopic. The eyes examined were all under the influence of a cycloplegic.

Discussion.—O. A. GRIFFIN (Ann Arbor, Mich.) gave reasons why the axes retain relation to hypermetropia and myopia, and thought it was largely due to the pressure of the lids on the globe. He remarked that the change of axis was greater in high hypermetropia. Bennett (Buffalo) thought there was a realm for axis in hypermetropia and myopia, and referred to over 7,000 examinations in which the axes were found in similar regions. He believed there were changes in

each decade. Harlan (Philadelphia) referred to his studies of the subject, giving percentages for symmetric and unsymmetric axes in astigmatism. L. J. Borsch (Philadelphia) mentioned a modified Placido's disc for detecting astigmatism, shaped like a square, the configuration of which was subject to alterations in the presence of astigmatism.

An Exact and Secure Tucking Operation for Advancing an Ocular Muscle. Illustrated by Demonstration on a Manikin.

F. C. Todd (Minneapolis) gave a brief review of the various methods of shortening the tendon by folding, detailing the surgical principles involved. The disadvantages of the advancement operations, such as lack of exactness and security of results, difficulty in determining the results until completion of the operation, cutting of the suture in the tendon along its fibres, etc., were related. The essayist then referred to his own operation, giving the various steps in its evolution. The improved instrument was shown. Todd remarked that the instruments bearing his name were imperfect, with the exception of one in his own possession, and allowed the tendon to slip over its prongs; this he obviated by having the prongs broadened just before the point is reached. In performing his operation he first made a broad oval conjunctival flap with the base toward the inner canthus which was then turned back, exposing the tendon. The underlying attachments were loosened by blunt dissection and the tendon tucker placed upon the tendon, one prong above and the other below it, the one beneath being to the nasal side. The screw at the lower end of the muscle is then tightened and the tendon folded upon itself by the lower prong passing over the upper. The first suture is of catgut, and is made at the upper margin of the folded portion of the tendon, and the second suture, also of catgut, is made at the lower margin, the central part of the fold being untouched. A second set of silk sutures is then introduced. The first suture, carrying two needles, is passed through the lower part of the tendon back of the previously introduced catgut sutures. One needle is then made to pass through the sclera near the corneal margin, another through the reflected conjunctival flap. Another similar suture is then introduced at the upper part. The ends of these sutures are

tied with a slip knot and the instrument is removed, after which the position the eye is to occupy is approximated and the sutures are securely tied. Cocain should be used preferably, although it does not render the operation entirely free from pain. If chloroform is used, the silk sutures should be tied in a bow-knot, and after the anesthetic has passed off the sutures are to be properly adjusted and securely tied. He believed in high degrees of strabismus, combined with tenotomy, the operation was of great value.

Discussion—G. C. SAVAGE (Nashville, Tenn.) said Todd's operation was a combination of his and Leglee's. He thought tucking operations were preferable to other methods for shortening the muscles and did not approve of operations in which the muscle was cut in two. He then described his method of tucking a tendon and warned against allowing the sutures to remain in for more than five days, owing to the occurrence of adhesive inflammation at this time. As an advantage of his operation over Todd's, he mentions the ability to raise or lower the attachment of the muscle. He also briefly described Leglee's operation. Wendell Reber (Philadelphia) thought no advancement operation could be considered easy. If the operation was performed for cosmetic purposes only, it made no difference whether the muscle was separated or cut loose. He believed the Worth operation to be comparatively easy and of great value. He had used the early type of Todd's tucker and found it very awkward and constantly feared the sutures would give way. L. W. Fox (Philadelphia) said he had performed the operation with failure, owing probably to the style of instrument employed. He had had Todd perform one for him, with every evidence of primary success at least. Wilkinson (Washington, D. C.) said that he would be sceptic of its use when the defect was large. Stevenson (Akron, O.) showed a modification of Worth's operation. He carried his sutures deep in the sclera and had no tearing out of the same. J. E. Weeks (New York City) said that operations in which the muscles are knotted were imperfect. The ideal operation was that which maintained the full diameter of the muscle. The sutures should be attached at the upper, middle and lower part of the cornea margin. Division of the muscle, in his opinion, did not imperil the result of the operation. He did not believe the position of the eye could be maintained by tucking

the muscle and did not favor operations in which the muscle was strangulated. In his operation he employs a quilted suture and goes through the scleral tissue. Plastic inflammation, in his experience, did not present in five days, and it was safe to allow the sutures to remain for seven to ten days. Lambert (New York City) describes Rees' operation. L. J. Borsch (Philadelphia) referred to DeWecker's operation. In closing the discussion, Todd said the tendon could be regulated beautifully for the correction of torsion with his instrument by shifting its axis. He does not cut off the muscle, but ligates it, and the redundant part later atrophies. The lump is very small and does not last very long. He rarely uses chloroform, except in very young children. The degree of pain depended largely upon the individual technic of the operator.

Subjective Refraction.

JOHN A. TENNEY (Boston, Mass.) in this paper brought forward a new subjective test for the determination of ametropia, in which the state of refraction in an eye may be determined by means of the pin-hole disc found in the trial case, or by a hole in a card. If the opening is held close to the eye and moved sidewise, objects will seem to move, like the light and shadow in the pupil when one uses the concave retinoscopic mirror. If myopia is present the motion will correspond to that of the disc; if there is hypermetropia the motion will be contrary. In simple hypermetropic astigmatism the motion will be opposite in the meridian of lesser curvature and no motion in the other. In simple myopic astigmatism the motion is contrary to that in the hypermetropic variety. When the ametropia is corrected no motion will be seen anywhere. It is understood that the accommodation is at rest in these examinations.

Discussion.—G. C. SAVAGE (Nashville, Tenn.) thought the method was both good and new, and gave his own experience with it. He believed that the judgment of motion and direction were gifts, not acquired, and depended to a large degree on the state of refraction of the eye. Clark inquired at what distance from the eye should the disc be held. In closing the discussion, Tenney said the disc should be held very close to the eye, and that patients found it very easy to carry out this test.

Double Radial Rupture of the Iris, Causing a Complete and Well-formed Iridectomy.

S. C. AYERS (Cincinnati, Ohio) reported a case of this character. The injury was the result of the impact of a leaden bullet, which was thrown by an air gun and struck the edge of the left lower lid. The iridectomy was as perfect in outline as if it had been done by a surgeon. The lens was opaque. The only parallel case is one reported in 1821 by Bunker. Numerous cases of slight tears of the pupillary margin are on record, as well as a number of more severe lacerations extending to its ciliary attachment.

Discussion.—LOCKEY (Wheeling, W. V.) related a case of rupture of the iris. L. Borsch (Philadelphia) saw a case with rupture of the eyeball and rupture of the iris, after recovery, from which there remained a vertical coloboma. Harlan (Philadelphia) thought that ruptures at the periphery of the iris were common, but that radial rupture was very rare, and could often be detected by the ophthalmoscope. In closing the discussion, Ayers referred to the frequency of iridodialysis and radial rupture, and the absence of any proper treatment for these conditions.

This terminated the scientific business.

The Committae for the Report on the Examination of the Eyes and Ears of School Children reported progress. Report was accepted and spread on the minutes.

A vote of thanks was extended to Dr. Brown, of the Geneva Optical Company, the W. T. Keener Company, of Chicago, and the local committee of arrangements.

THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

NINTH ANNUAL MEETING, DENVER, COLO., AUGUST
24-25-26, 1904.

The society held a successful meeting, Dr. Edward Jackson presiding. The following ophthalmic papers were read and discussed:

Hemorrhage from the Lacrimal Duct Following Removal of a Style.

By J. C. Buckwalter, M. D., St. Louis: Report of case. The style had been introduced into the lacrimal duct and lost six years previously. Several attempts had been made for its removal at different times without success. The style did not produce any marked symptoms of irritation until two months before its eventual extraction. While there had been troublesome epiphora and accumulations of mucopurulent secretion in the lacrimal sac from the incipency of the trouble, there had been no nasal symptoms until two months previous to the delivery of the style. During these two months the nostril was occluded much of the time, and there appeared a muco-sanious discharge from the affected side.

The style was delivered through the nostril. A small portion of the anterior part of the inferior turbinate body was removed to facilitate the delivery of the style. The style was much corroded with a dark metallic-like substance.

Hemorrhage started shortly after removal of style and continued unabated for four hours. As much as possible of the blood was saved and it measured four and one-half quarts. Patient's age about 39 years. Weight 210 pounds. There are no blood-vessels of any consequence in the nasal duct region aside from a dense venous plexus and arterioles. The foreign substance possibly eroded the capillaries, weakening their contractile power, or by lacerating the small vessels laterally, not clearly dividing them they could not contract.

A Criticism on the Use and Abuse of Lacrimal Probes.

Dr. G. F. Suker, Chicago, Ill.: This paper condemned the use of the very large lacrimal probe. The very conservative employment of medium sized or small lacrimal probes is deemed sufficient.

Some of the Accidents and Complications Met With in the Extraction of Cataract.

Dr. D. W. Greene, Dayton, O.: The author gave a brief review of the history of the operation, showing the evolution through which the different steps have passed, from Petit, 1706, and Daviel, 1745, to the present time. The shifting of the section forward until it is now made entirely corneal was mentioned. The smaller iridectomy or its entire omission. The different methods of opening the capsule and delivering the lens and cortical debris and the so-called toilette of the operation were described. Combined operation is usually made. What are accidents in and what are complications of the operation? A strict definition of each is difficult. Management of a norma case. Management of accidents and complications. Accidents are usually operative. Complications may be present at the time of operation; may result from accidents during operation, but as a rule are post-operative. Age as such is never a contra-indication. Physical and mental conditions incident to it may be complications. When anesthetics are used. When anterior leaf of capsule is extracted. When lens is extracted within the capsule. Flannel bandages, lint and cotton compresses. Confinement in bed not rigidly enforced after second day. All of which is intended to lead up to and make clear the title of the paper and the subjects treated under it.

Removal of Anterior Capsule and the Hypodermatic Use of Morphia in Simple Extraction.

Dr. Eugene Smith, Detroit, Mich.: Smith believes that extraction of a large central portion of anterior capsule with properly constructed capsule forceps is superior to use of the cystotome. In more than 90 per cent. of cases it obviates necessity for discission of capsule, which is not always a harmless procedure. Many times in cases of thickened cap-

sule the lens may be delivered in the capsule and without loss of vitreous. Ideal method in case of Morgagnian cataract. Hypodermatic use of morphine contracts pupil; allays distress following operation; also alleviates tendency to cough, if present.

The Safest Operation for Senile Cataract.

Dr. H. Gifford, Omaha, Neb.: Abstract: 1. Discussion of the advisability of iridectomy, simultaneous or preparatory. 2. The advantages and disadvantages of a conjunctival flap. 3. Operations with large detached conjunctival flap, including Czermak's subconjunctival operation.

The author makes the iridectomy in all cataract extractions. He also favors preliminary iridectomy.

Complications Following Cataract Extraction in Glaucoma.

Dr. Louis J. Goux, Detroit, Mich.: Abstract: Cataract due to glaucoma. Report of case. Difficulties encountered in extraction; lens delivered by intra-ocular pressure. Sequelae: Post-operative hemorrhage, orneal fistula. What prophylactic measure would have been advisable? He advocates the preliminary scleral puncture (Priestley Smith's method). This reduces the tension, restores the anatomic relationships, and renders iridectomy and extraction comparatively easy of performance.

Central Superficial Chorioiditis.

Dr. T. B. Schneideman, Philadelphia, Pa.: The case reported occurred in a lady. The subjective symptoms was a central scotoma. The vision at its worst equalled one third of the normal. Objectively the ophthalmoscope showed edema of the macula at first, followed after some little time by the development of half a dozen yellowish white plaques of chorioiditis. A complication was discovered consisting of a purulent discharge of the sphenoidal sinuses of each side. This was at first supposed to stand in some causative relation with the ocular affection. But this view was abandoned. At the expiration of a year from the onset the scotoma had disappeared and vision had become full in quantity, though slight discomfort in seeing persisted for some time.

The patient, an oculist, using the ophthalmoscope and retinoscope daily with the right eye, was convinced that the

ocular affection had been set up by excessive use of the eye. The disease here presented belongs to the group of chorioid-al affections of the macula known as guttate chorioiditis, frequently also called Tay's chorioiditis. In the absence of a constitutional taint or infective process, the explanation of the origin of these diseases is quite obscure. It may be as Nettleship has recently pointed out that the blood stream in the extremely close capillary network of both the chorioid and retina in the macular region, intimately dependent as it is upon the condition of the supplying arteries, would directly feel the effects of any affection of these arteries, so that an endarteritis or other condition narrowing the lumen of the posterior ciliary arteries would cause a disturbance at the macula, while the rest of the fundus might escape.

Lantern Demonstration on Glioma and the Question of Rosettes.

Dr. A. Alt, St. Louis, Mo.: Abstract: Since Wintersteiner has first drawn particular attention to certain appearances in glioma, well known before, given them the name rosettes and claimed them as due to neuro-epithelial cells, and, in accordance with this, has proposed to call certain gliomata neuro-epitheliomata, further critical studies regarding these points have been but few. Very similar formations are often found in detached and firmly compressed retinae, but they are not the same thing. Rosettes or similar figures are formed whenever and wherever glioma cells grow around another tissue or cell, and their presence or absence does not prove that there are several distinct forms of glioma.

Gifford related two cases, supposed to be gliomata, in which operative intervention was refused. Much to his surprise, some five or six years later, there was no apparent change. Jackson cited a similar experience. Alt had mistaken a syphilitic gummatous tumor of the retina for glioma. Under vigorous antisyphilitic treatment the supposed tumor disappeared.

A New Series of Semaphore Charts for Testing Vision of Railroad Employees. Designed by Nelson M. Black, M. D., of Milwaukee.

Dr. H. V. Würdemann, Milwaukee, Wis. Abstract. The author makes no claim of originality, but uses the figure of

a semaphore signal, pole and all, accurately reduced by scale to represent at twenty feet the actual signal seen at one-half mile (2,640 feet). The colors used are the same as are used in actual practice, and the back-ground is a grayish tinge to represent the average horizon, against which signals with an ideal background are seen. Both the semaphore and the Hall or disc signals are represented.

AUGUST 24.

Some Unique Cases of Amblyopia.

Dr. T. W. Moore, Huntington, W. Va.: Moore reported in detail three cases of amblyopia occurring in school children from ten to seventeen years of age with very slight refractive errors, that had contracted fields when the vision was subnormal and normal fields for white and colors when the visual acuity was normal.

He protests against their classification under the head of hysterical amblyopia upon the grounds that both eyes were affected to nearly the same degree, and that the size of the fields always varied proportionately to the central vision.

His conclusion is that these cases are due to an arrest of the functional activity of certain retinal cells, probably due to overwork at about puberty, and thinks with Fox that the remedy is the constant electric current which stimulates these cells to resume their work and has proven curative in all the cases where tried.

He thinks that retinal anesthesia is not a good term for this affection, believing that its use for years to define widely differing conditions by different authors makes it too indefinite and suggests that Retinal Torpor might be better.

The Toxic Amblyopias, with Special Reference to Those Produced by Tobacco and Coffee.

Dr. A. E. Bulson, Jr., Ft. Wayne, Ind.: The references to coffee amblyopia are but few and brief in ophthalmological literature. Visual disturbances are not uncommon in persons who drink coffee to excess, and the trouble is corrected in some by abandoning use of coffee, while in others active treatment is required to restore function. There is concentric contraction of the visual fields for all colors, usually with, but sometimes without, marked impairment of central vision,

and this is the most conspicuous manifestation. Persistent central scotomas are not observed, asthenopic symptoms and scintillating scotomas are not uncommon. Aside from slight paleness of the temporal half of the disc in two cases, there were no fundus changes noted by ophthalmoscopic examination in the cases under observation. Casey Wood's theory, that many of the toxic amblyopias are due to the production of ptomaine poisoning by the particular toxic agent taken into the system, is thought to be a reasonable explanation of the occasion of coffee amblyopia. The author reports several cases. One case was observed through two relapses. Another marked case seemed to be produced by the combined effect of tobacco and coffee, but did not improve until the use of coffee was abandoned. Permanent atrophic changes would probably result in long continued cases. In recent cases the prognosis is good. Treatment is the same as for other toxic amblyopias. Elimination is essential. Strychnine brings about early improvement of central vision and widening of the visual fields.

The Use of Pure Nitric Acid in the Treatment of Diseases of the Eye.

Dr. J. W. Bullard, Pawnee City, Nebraska: Very little has been written on the subject. This agent is one of the most powerful escharotics in the mineral acid group, but as it coagulates the albumen of the tissues without redissolving it, in this way, safeguards its own excessive action. (Potter.)

Its action can be controlled to a nicety. It is easy of application, and in the great majority of cases its action is just as effectual as is the actual cautery, over which it possesses many advantages both to the surgeon and to the patient.

The mode of application is as follows: The eye having been prepared, cocanized and held open, a pine stick whittled down to a blunt, not a sharp point, is dipped into the pure acid and held till all the moisture has disappeared from the stick, when the edges and bottom of the ulcer are touched. It prevents the further invasion of the tissues by microorganisms by forming a zone of coagulated tissue around the ulcer, thus closing the lymph spaces.

Its use is indicated in all infected ulcers of the cornea and

conjunctiva. In fact, it may be used in any case where a cauterant is indicated.

It possesses advantages over both carbolic acid and iodine. It is very serviceable in the obliteration of chronic vascular conditions of the cornea, and in the after treatment of pterygium operations.

The author has been using it almost exclusively, where a cauterant is indicated, for the past twenty years, very rarely resorting to the use of the actual cautery, and with such good results that he thought it advisable to bring the subject before the Academy.

Notes on the Use of Dionin.

Dr. T. C. Hood, Indianapolis, Indiana. Dionin is known chemically as ethylmorphin hydrochlorid, and is a homologue of codein. It is an analgesic. The power of atropin seems to be increased by it. Dionin is a powerful vasodilator and lymphagogue. It promotes absorption of exudation deposits in the pupillary space and aids the removal of post-operative debris after cataract extraction. It aids in clearing the opacities in certain cases of interstitial keratitis. Dr. Hood reported nine cases in which it had been used with benefit.

Alt said that dionin increased the pain in iritis. Bulson considered its use a distinct advance in ocular therapeutics.

A Case of Unilateral Nystagmus, with Remarks on the Probable Cause.

Dr. S. Kirkpatrick, Selma, Ala., described a case of this rare disease. Nearly all of the cases previously reported were of the vertical type. Refractive error was the probable cause, as it was controlled by wearing a full correction for her anisometropia and oblique astigmatism.

Further Experience and Treatment of Keratoconus.

Dr. J. A. L. Bradfield, LaCrosse, Wis., said that keratoconus in the incipient stage is not only curable, but considerable ectasia of the cornea can be reduced to normal corneal tissue. When the ectasia has advanced till the cornea becomes thinned, palliation is only possible and vision always is greatly impaired. He reported four cases, illustrating the different stages and results of treatment.

OPHTHALMOLOGICAL SOCIETY OF PARIS,
JULY 5, 1904.

TRANSLATED FROM THE FRENCH BY DR. E. C. ELLETT,

MEMPHIS, TENN.

Sub-Conjunctival Cysticercus.

F. Terrien: Cases of conjunctival cysticercus are very rare. Graefe found only five cases in 80,000 patients. In the case reported the anatomical examination and measurement of the hooks showed that it was *taenia solium*, and consequently a cysticercus cellulosae.

Fibroma of the Orbit.

Chevallereau and Chaillous report the case of a young girl, 18 years old, who presented in the upper and outer angle of the orbit a tumor the size of an almond, which had appeared eight years previously, following traumatism. The operation showed an encapsulated growth, with extension into the orbit, and strong adhesion to the periosteum of the orbital roof. Six months after the operation the patient was seen again. There was no recurrence and no deformity. The tumor proved to be a fibroma, probably springing from the periosteum of the orbit.

Blindness and Cranial Deformity.

Morax and Patry presented the photographs of seven patients having post-neuritic atrophy and cranial deformity. The blindness had come on after the tenth year and is complete, or there is quantitative perception only. The cranium is high, flattened transversely, with regular sagittal curvature. The face is asymmetrical and long. The eyes are prominent—the frontal eminences lacking. The superciliary ridges are slightly projecting.

Six of the seven patients are males. Forty-two such cases have already been published. They all present post-neuritic atrophy and a steeple-shaped skull. The etiology is obscure. The deformity is due to premature ossification of the coronal suture, and the atrophy to a narrowing of the optical

canal, or to increased intracranial pressure, or perhaps to meningitis. Each cause could produce both symptoms. It would be interesting to study so characteristic an affection from its onset. Doubtless it is much more frequent than one would suppose from the small number of published cases.

Concerning the Question of Iridectomy in Glaucoma with Intermittent Crises.

Valude: In glaucoma, characterized by frequent attacks of blindness without acute pain, and with periods of complete remission, iridectomy is not free from danger. In four patients presenting this clinical picture iridectomy properly done and under good conditions, has given the following results: one successful; one mediocre; one bad result (almost complete loss of vision), and one very bad result—in that the eye was attacked the day after the operation with a hypertension, which ended in absolute glaucoma. We should do an iridectomy only after considering the possible consequence of it, and if the use of myotics suffices to allay the symptoms, it would be prudent to be content with that.

On the Relation of Corneal Opacities to Myopia.

Sulzer (report on the work of Frenkel): We have known for a long time that corneal opacity predisposes to myopia, but the pathogenesis of this combination has never been elucidated. Corneal opacity always causes irregular astigmatism, and this astigmatism may be in itself a predisposing cause of myopia. This myopia is progressive and bilateral, if the opacities are bilateral, and unilateral if the corneal lesion is unilateral, and in the latter case attacking the eye used for near vision. Visual acuity undergoes a progressive diminution. Axial myopia, which follows opacities of the cornea, depends on the nearness with which objects must be held and on lesions of the fundus, lesions which the author has never found in the cases he has studied.

Preliminary Report on Researches in the Variation of Concentration of the Intraocular Fluids and their Influence on the Tension of the Eye.

Rochon-Duvigneaud and Onfray: Following the physiological and clinical experiments of Winter, Archard and

Loeper, Widar and others, Cantonnet (*Arch. D'Ophtal.*, January and May, 1904) supposes that the eye, from a hydrostatic point of view, can be considered as a lymphatic diverticulum from the blood current, at the other end of which is the kidney. Should the latter become hypopermeable, the molecular concentration of the eye can be increased, which causes a demand for water, and an increase in the volume of the globe. Glaucoma would, therefore, be a sort of local edema. From an experimental point of view, the question may be proposed thus:

1st, Can we determine in animals the variations of the density of the vitreous; 2nd, Have these variations any influence on intraocular tension. These studies necessitate, first, a study of the normal density of the vitreous, and then that of the intraocular tension, of which we should be able to certainly recognize the slightest variations.

Study of the Normal Density of the Vitreous: Chemical analysis of three specimens of vitreous from rabbits give the following figures in terms of NaCl: 1st, 84 per cent.; 2nd, 67 per cent.; 3rd, 53 per cent. Such wide differences imply errors of method, which it is necessary to correct. We would only note that the average is considerably higher than the per cent. of NaCl in blood serum (55 per cent.).

Cryoscopy: Two quantities of vitreous, each composed of the contents of six eyes and giving a volume of 8 Cc, give us for the 1st, $w = .75$; 2nd, $w = 1.28$. While widely different and not conclusive, these freezing points are notably above that of the serum of the rabbit, which is .56.

Hematolysis: The liquid which separates from the vitreous is not all hemolysant. In order for it to become so, it is necessary to dilute it with equal parts of distilled water.

The percentage of soluble elements of the vitreous liquids examined is about 9 per cent. These figures are approximate and we mention them merely to show the agreement between the results of this method of hematolysis with those of other methods employed. In regard to intraocular tension, we are convinced that this can be measured accurately only by the use of a manometer such as Leber's.

We can only say that the vitreous is hypertonic in relation to serum, that it consequently seems to bear about the same relation to blood that the cerebro-spinal fluid does. Under the influence of osmosis alone it could not take up the soluble elements from the serum, at least not under physiologic conditions, having determined exactly the density of the vitreous, it remains to be seen if it can be varied (ligation of the renal pedicle, saline injection, etc.) and if this modifies the tension. The means employed have not so far given a satisfactory determination of any variation of the tension.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

Prof. Heisrath, of Koenigsberg, is dead.

Dr. Carl Barck, of St. Louis, has returned from a short European trip.

Dr. Szymanowski has been appointed to the chair of ophthalmology in Kieff.

Dr. Amilcare Bietti has been recognized as *privat-docent* of ophthalmology in Padua.

Dr. W. M. de Vries has been recognized as *privat-docent* of ophthalmology in Amsterdam.

Dr. W. Reis has been recognized as *privat-docent* of ophthalmology in the University of Bonn.

Dr. Fleischer has been recognized as *privat-docent* of ophthalmology in the University of Tübingen.

The new editor of the ANNALS will welcome suggestions from subscribers looking to the improvement of this magazine.

Dr. Charles Stedman Bull, of New York, has been elected president of the American Ophthalmological Society.

Dr. W. M. Killen has been appointed surgeon to the Ulster Eye, Ear and Throat Hospital, in the place of the late Dr. McKeown.

Dr. Frank Vinsonhaler, of Little Rock, Arkansas, and Dr. J. W. Meacham, of Clarksville, Tenn., were recent visitors to the World's Fair.

Beginning with the January (1905) number, the *ANNALS* will show a number of improvements. A better quality of paper will be used and more care will be given to the press-work.

On August 2nd a meeting of the friends of the late Dr. W. A. McKeown was held and it was unanimously decided that "a suitable memorial should be raised to perpetuate his memory."

Dr. Hermann Knapp, emeritus professor of ophthalmology in Columbia University, recently celebrated at Giessen the fiftieth anniversary of his doctorate. His diploma was renewed by the University.

Among the American ophthalmologists who attended this year's meeting of the British Medical Association are S. D. Risley and Charles A. Oliver, of Philadelphia, Karl Koller, of New York, and Lucien Howe, of Buffalo.

The death is announced of Dr. Carl Genth. The *Atlas der Pathologischen Anatomie des Augapfels*, of Pagenstecher and Genth, is well known to the older ophthalmologists. This splendid work was translated into English in 1875, by Sir William Gowers.

The Section of Ophthalmology of the International Congress of Arts and Sciences was held in St. Louis, September 21, under the chairmanship of Dr. George C. Harlan, of Philadelphia. The speakers were Edward Jackson, of Denver, and George M. Gould, of Philadelphia.

Dr. Robert C. Moon, of Philadelphia, has been in St. Louis recently. Dr. Moon is secretary of the Pennsylvania Home Teaching Society and Free Circulating Library for the Blind. Many years ago, in conjunction with the late Mr. J. Z. Lawrence, he wrote a treatise on Ophthalmic Surgery. The Moon alphabet for the blind, which was invented by the father of Dr. Moon, is well known.

Prof. Charles Alphonse Gayet, of Lyons, recently died at the age of seventy-two years. Since 1876 he held the chair

of ophthalmology in Lyons. He was known as a careful practitioner and skillful operator. The deceased professor was a member of the Académie de Médecine and officer de la Légion d'honneur. His numerous contributions to ophthalmology were published in the *Annales d'Ophthalmologie* and in the form of theses.

The French Encyclopedia of Ophthalmology is soon to be published by M. Doin, 8, Place de l'Odéon, Paris. It will appear in eight octavo volumes, of about 600 pages each, with numerous figures in the text. The work will be edited by Lagrange, of Bordeaux, and Valude, of Paris. The collaborators are Angeucci, Berger, A. Broca, Chevallereau, Dufour, Fage, Gama Pinto, Javal, Kalt, Lagrange, Morax, Motais, Parinaud, Parent, Rochon-Duvigneaud, Rohmer, Rollet, Sulzer, Sauvineau, Truc, Tscherning, Valude, Van Duyse and Vennemann.

BOOK NOTICES.

The Pathology of the Eye.

PARSONS J. HERBERT, B. S., D. S. C. (LOND.). F. R. C. S. (ENC.). Assistant Ophthalmic Surgeon, University College Hospital; Curator and Pathologist, Royal London (Moorfields) Ophthalmic Hospital; Lecturer on Physiological Optics, University College, London. Volume I, Histology—Part I. New York: G. P. Putnam's Sons. London: Hodder and Stoughton, 1904.

At last, an Englishman has written a book on the pathology of the eye, which is not only equal to but actually surpasses the German monographs on this subject. After a careful examination of Part I, we can say that Parsons' work will undoubtedly be in every respect the greatest literary contribution that has ever been made to the pathology of the eye.

Attempts have been made previously to describe and illustrate the pathology of the eye, by Wedl (1860), O. Becker (1874), Pagenstecher and Genth (1878), Alt (1880), Wedl and Bock (1886), Greeff (1902) and Ginsberg (1903). All of these are out of date, except the manual of Ginsberg and the yet incomplete work of Greeff.

Parsons' work is to appear in four volumes. Volumes I and II will consider the eye and its adnexa, and the pathology of the various morbid conditions to which they are subject. Volumes III and IV will treat of the diseases which affect the eye as a whole, such as glaucoma, sympathetic ophthalmia, congenital malformations, etc.

Volume I, which is now before us, includes the pathologic histology of the lids, conjunctiva, cornea, sclera, iris and anterior chamber and ciliary body, together with the bacteriology of the conjunctiva. The normal histology is presented, although no attempt has been made to give exhaustive descriptions.

The author acknowledges the aid he has received from reading the works of Ginsberg and Greeff, although he has

gone to the original sources for his information, and has endeavored to set forth the facts which have appeared in various European and American scientific journals. He also acknowledges his indebtedness to the staff of the Royal London Ophthalmic (Moorfields) Hospital, and to the Ophthalmological Society of the United Kingdom.

Not only is the text of this work excellent, but the illustrations are well executed. An appropriate bibliography is appended to each subject. In all respects Parsons' book is an admirable production, which reflects credit upon the author and his English co-workers. The publisher deserves the thanks of the profession for the sumptuous manner in which the work is presented.

Surgical Anatomy of the Head and Neck.

DEAVER, JOHN B., M. D., SURGEON-IN-CHIEF TO THE GERMAN HOSPITAL, PHILADELPHIA. Illustrated by 177 Plates, nearly all drawn from Original Dissections. Royal Square Octavo, pp. xii—770. Philadelphia: P. Blakiston's Sons & Co., 1012 Walnut Street, 1904. Price, in half-Morocco, \$12.00.

It was a happy thought on the part of the publishers of Deaver's monumental cyclopedia of surgical anatomy to incorporate, in one volume, the text and plates descriptive of the head and neck. The present work contains the anatomy of the neck, mouth, pharynx, soft palate, larynx, nose, sinuses, orbit, eye, ear, brain and face. Thus the book will appeal to oculists, aurists, rhino-laryngologists, neurologists and surgeons.

The appearance of the book is in keeping with the subject. The volume contains 770 extra large octavo pages. It is printed on good paper and the press work is of the best. The binding is exquisitely done in half-morocco. Of the plates it is hardly necessary to speak, since Deaver's reputation as an accurate anatomist was long since established on a firm foundation. All of the plates are excellent, except XCIII, which purports to show the "Retina of the Posterior One-half of Right Eyeball." Here we find the retinal vessels extremely tortuous—a condition, which, if not pathologic, is certainly anomalous.

We congratulate the publishers on the appearance of this

Precis D'Ophthalmologie.

LAGRANGE, FELIX, Professeur agrégé à la Faculté de Médecine de Bordeaux. Deuxième édition. Avec 286 figures dans le texte, et 5 planches en chromolithographie hors texte. Paris: Octave Doin, 8, Place de l' Odéon, 1903.

This duodecimo volume of 800 pages is an unusually creditable hand-book of ophthalmic practice and is designed for the use of students. It is superior to most books of its class, the subjects being presented in a methodic as well as in an attractive form. Although a small book, it contains much information that is not infrequently to be found in large text-books. No doubt it will continue for many years to be a favorite with French medical students.

Histologie Pathologique de l'Oeil.

PARISOTTI, PROFESSEUR Q., Privat Docent a l' Université de Rome; Officier de l' Instruction Publique. One quarto volume with 20 chromo-lithographic plates. Pages VIII—224. Librairie J. B. Ballière et fils, 19, rue Hautefeuille, Paris, 1904.

This work contains 221 pages of text and more than 100 colored illustrations on 20 plates. The first chapter treats of histologic technique. In chapter II diseases of the lids are discussed (xanthelasma, transparent cysts, vacular naevi, lymphangioma, elephantiasis, neuroma, molluscum contagiosum, gumma, lupus, epithelioma, sarcoma, acne and chalazion). Most of these subjects are given brief notices; however, six pages are used in describing chalazion. In Chapter III diseases of the conjunctiva are presented in a satisfactory manner. Space forbids an account of the various subjects which are mentioned in this excellent work. We must call attention, however, to the thorough articles on sarcoma of the chorioid and glioma of the retina.

The illustrations form an exceedingly valuable feature of the book. All of them are in colors and they reproduce accurately the appearances which the microscopic sections present. Those of our readers who are familiar with the French language will derive much pleasure from the possession of this book.

Atlas und Grundriss der Lehre von Augen-Operationen.

HAAB, DR. O., PROFESSOR, in Zürich. Mit 30 farbigen Tafeln und 154 schwarzen Abbildungen von Maler J. Fink. München. J. F. Lehmann's Verlag, 1904.

Atlas and Elementary Treatise of Eye Operations.

By PROF. DR. O. HAAB, of Zürich. With 30 colored Plates and 154 black Illustrations by J. Fink, Artist. F. Lehmann, publisher, Munich, Germany, 1904.

This is a duodecimo volume of 399 pages. The author states in his preface, that he has collected these operations, which in his thirty years' activity in the domain of ophthalmology, are most serviceable, although in his extensive experience he had not an opportunity to perform all that are described in the work.

The first seventy pages of this strictly Teutonic volume are devoted to general considerations, which are extremely practical and reveal an exceptional familiarity of the subject by the masterly way in which they are written. Furthermore, many of the points mentioned, although of such great importance to the young ophthalmic surgeon, are seldom considered in even more extensive treatises on ophthalmology. The fact that not only the sight of one eye but also that of its fellow may be jeopardized by an unfortunate result after an operation, in which the eyeball is opened, is emphasized. Objections are raised to the classification of operative ophthalmology under the category of minor surgery, which is in everybody's reach. An eye operation, which disappoints the expectations of a patient, is often more tragic than death. An ophthalmic surgeon should be calm, deliberate and experienced and should command well trained and skilled assistance:

1. *Hospital and Operating Rooms.*—It is not absolutely necessary to have tile floors and rooms with painted walls which do not come in contact with the field operation, but the surgeon, his assistants and nurses should exercise scrupulous cleanliness about their hands and person, to which soap and water, often too sparingly used, forms a good initiative

Many operations should be performed while the patient lies in bed.

2. *Narcosis*.—General anesthesia should be reduced to a minimum. Individuals with an enlarged thymus gland, a condition which can not be diagnosed with certainty, are unsafe subjects for chloroform anesthesia; these persons frequently present an hyperplasia of their lymphatic tissues, which is a graver contraindication to general anesthesia than a valvular lesion of the heart. Patients are preferably allowed to emerge from profound narcosis and show slight reaction, before the optic and ciliary nerves are severed, as severe collapse may follow from shock after this last step. The author employs local anesthesia wherever it is possible, but more than 0.05 gramme cocain for operations about the head, according to his experience, should not be used.

3. *Sterilization, Antisepsis and Asepsis* are next extensively dealt with and the latest opinions and methods in their employment are enumerated. In addition to the usual precautions in vogue, the author shaves the eyebrows and cuts the eyelashes to insure greater cleanliness of the field about the operation and the lid margins. Attention is called to postoperative infections from a bursting of the wound as late as 6 or 8 days after the operation, which can be prevented by keeping the eye protected by a bandage or wire shield. The operator should wear a bandage over his mouth that he may speak to the patient with impunity without incurring the risk of infecting the wound with his saliva. Care should be exercised not to render the instruments septic after sterilization by careless handling. The sterilization of the local anesthetics, employed in eye surgery, is emphatically recommended. An observation is made in reference to weak solutions of cocain, deteriorating if repeatedly boiled for twenty minutes and over. The author has introduced Sidler-Huguenin's bottle and specially constructed dropper in his practice on account of the many advantages it possesses over others from a standpoint of asepsis. All instruments should be boiled. The introduction of sterile iodoform into the anterior chamber is advocated as an excellent means of intraocular disinfection.

The body of the work follows with a detailed account of the operations in vogue in modern ophthalmic surgery. Many valuable hints are enumerated under operations on the lens, as the various forms of cataract; then discussion of the lens in high grade myopia is considered, but is recommended

in extreme degrees only and in selected cases. Subluxated lenses in younger individuals should not be extracted with the instruments designed for this unfortunate condition, but discission yields more satisfactory results in accordance with the author's mature experience.

The excellent Hess operation for ptosis is mentioned and described under the category of operations on the eyelids and the conjunctival sac. Many useful suggestions are made regarding the rational application of the giant magnet introduced into ophthalmic practice by the author. Kroenlein's operation is well described.

Generally considered, the volume is an exemplification of the most modern and approved practical operative procedures. The clear, concise and graceful style of the text is elucidated by 154 illustrations and thirty colored plates, many of which are excellent, especially where an inflammatory process existed in the eyeball. Plates 2, 3, 4, 5, unfortunately, on account of the slight imperfections of lithographic processes, still to be overcome, represent an undue amount of injection in these eyes, caused by overtinting with red.

The work will form a valuable addition to all libraries of ophthalmologists. Those having wide experience will barely hail the illustrations with the enthusiasm of the younger men. Furthermore, the book is extremely valuable, as it was written by an eminent and justly popular teacher of ophthalmology, who has not lost his personality on a single page of the book and whose practical statements display his wide experience in every paragraph.

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No. 4.

EDITORIAL NOTES.

Proposed International Ophthalmological Society.

MR. W. M. BEAUMONT, a well known ophthalmologist of Bath, England, has recently issued a pamphlet to the members of the Tenth International Ophthalmological Congress, calling attention to the need of an International Society of Ophthalmologists. He states that the nine preceding Congresses mark important advances in ophthalmic science and contends that such gatherings should be bound together in an unbroken continuity. To accomplish this he proposes that an International Society be

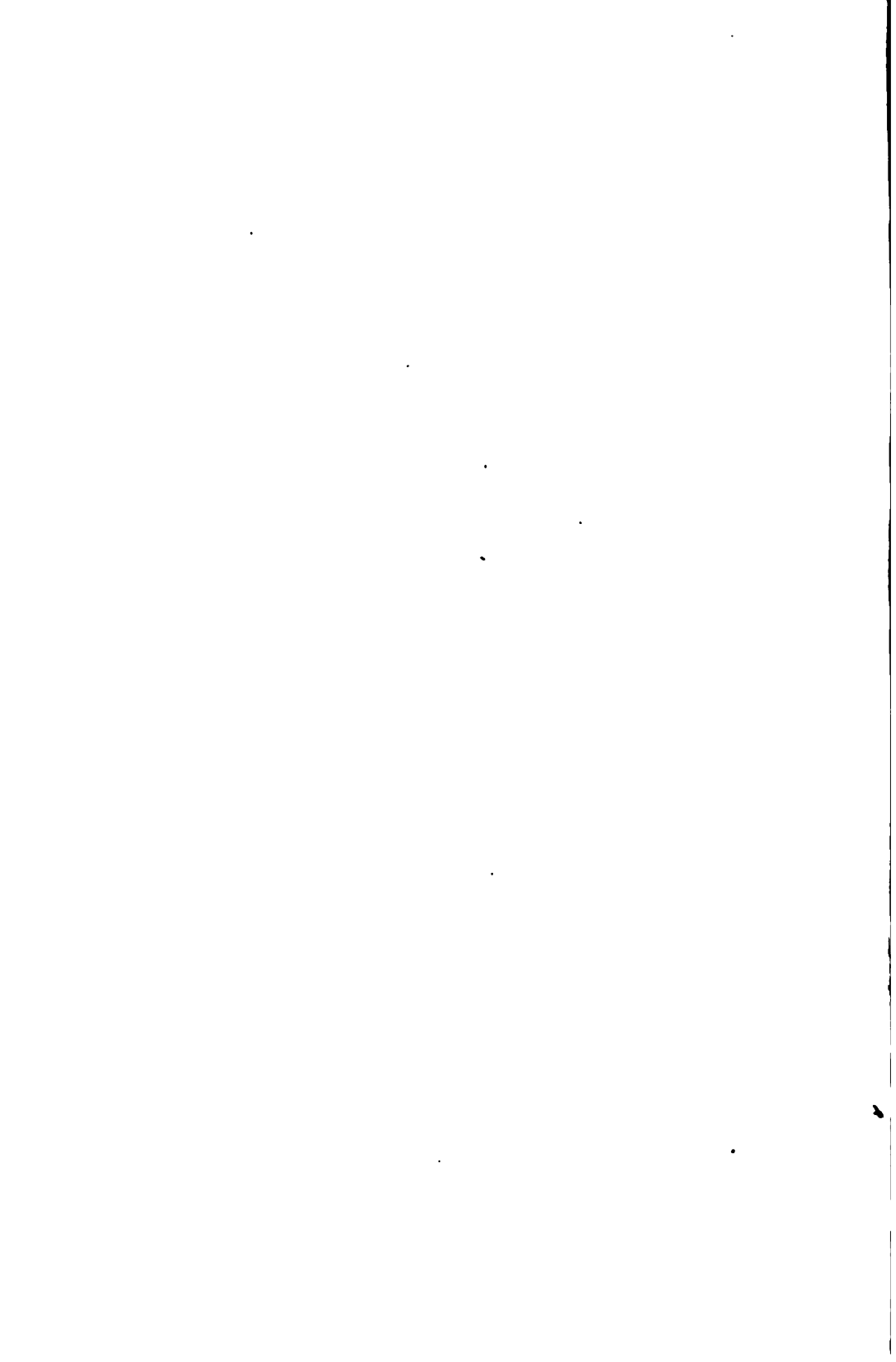
formed. Such an organization could supply its members annually with a report of the progress of ophthalmology in all parts of the world and, furthermore, could assume the publication, in the various languages, of important monographs. Added to this is the advantage that members of the proposed Society, travelling in foreign lands, would receive greater facilities for observing the work of their *confreres*. Thus an *entente cordiale* would be established, which could not fail to be beneficial. We are heartily in favor of Mr. Beaumont's proposal and await further developments with interest.

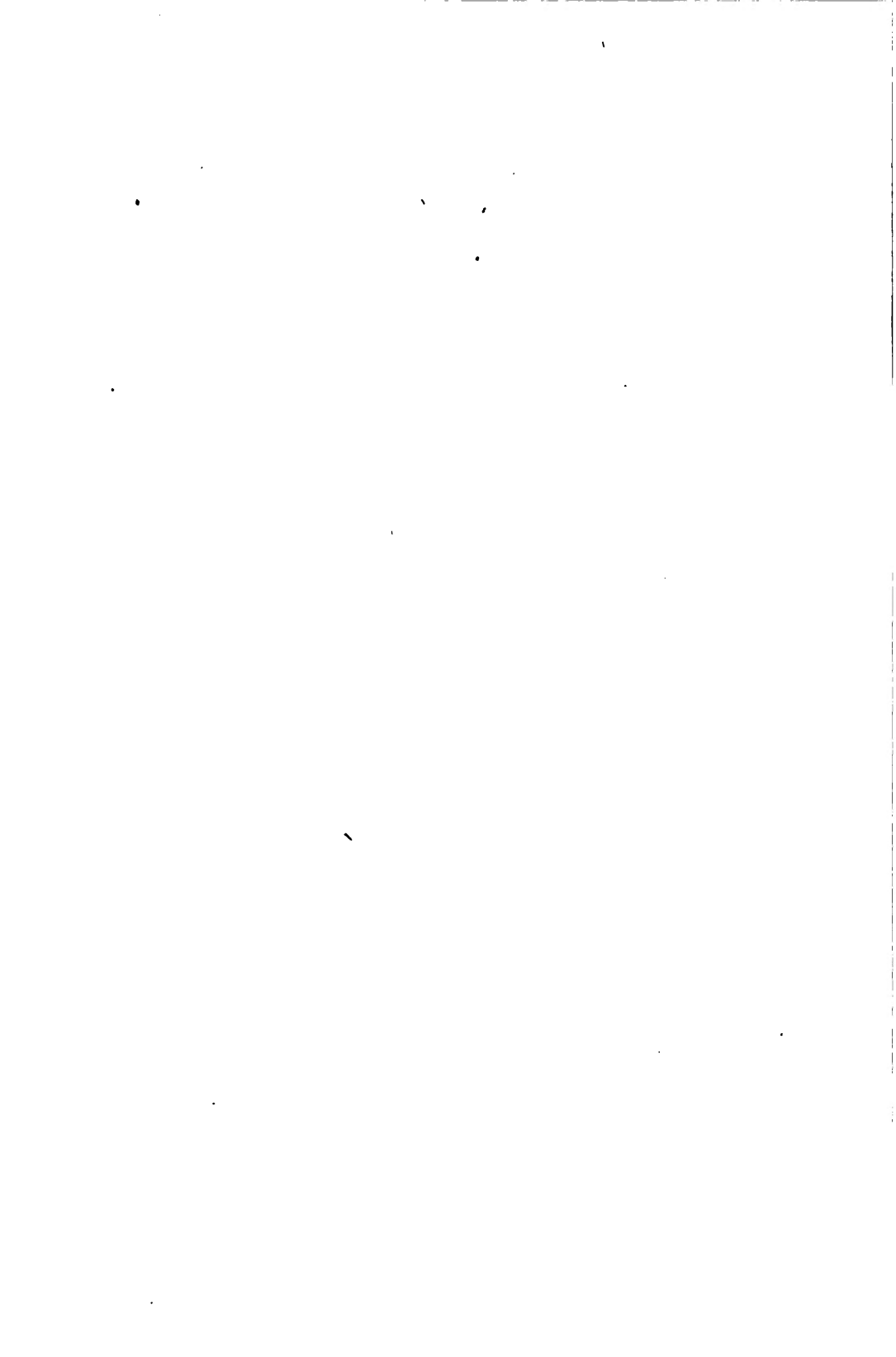
SOON the ANNALS will enter upon its fourteenth year of existence. Attentive readers will notice the absence of many old names and the presence of new ones upon its Editorial Staff. During 1905 this publication will be improved and an earnest endeavor will be made to render the ANNALS more useful than ever to the ophthalmic practitioner. The paper and press work will be of better quality, while the editor and his assistants will attempt to give their readers a practical, up-to-date journal. It may not be out of place to state that this publication possesses the largest subscription list of any of the ophthalmic journals printed in the English language.

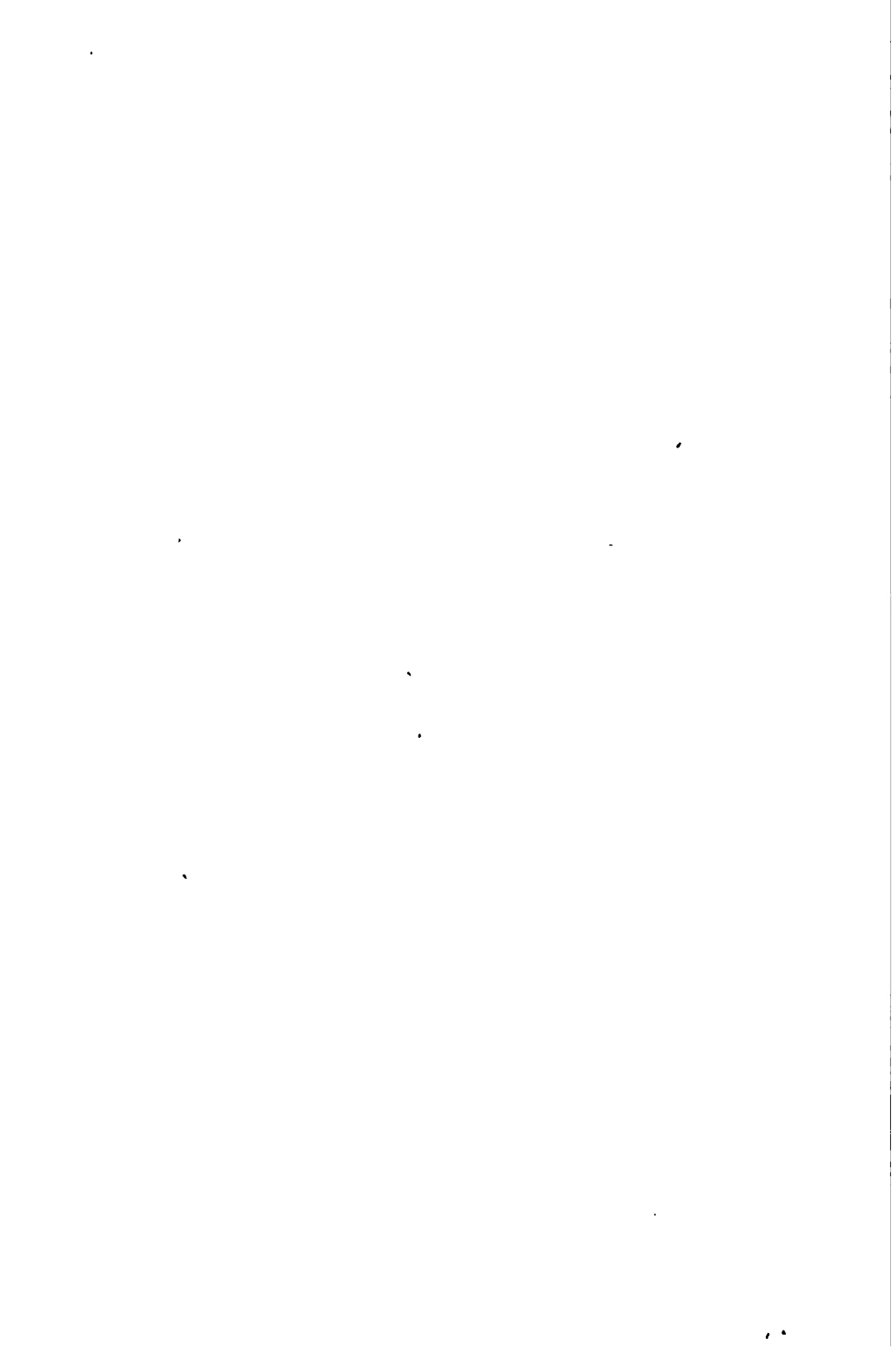
**The
Coming
Year.**

SAINT LOUIS this year has not only given the world the greatest exposition known in history, but has furnished the inspiring spectacle of a magnificent International Congress of Arts and Sciences. Every branch of human learning seems to have been properly presented. Certainly the addresses of Doctors Jackson and Gould, delivered before the Section of Ophthalmology, were worthy of the occasion.

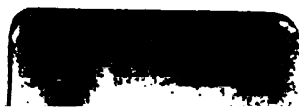
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